Presidential Address

ON

THE WHEAT-SUPPLY OF THE WORLD, THE LATEST ACHIEVEMENTS OF SCIENCE, AND THE POSITION OF PSYCHICAL RESEARCH.

Delivered before the British Association for the Advancement of Science at Bristol on Wednesday, September 7th,

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GENTLEMEN,—For the third time in its history the British Association meets in your city of Bristol. The first meeting was held under the presidency of the Marquis o Lansdowne in 1836, the second under the presidency of Sir John Hawkshaw in 1875. Formerly the President unrolled to the meeting a panorama of the year's progress in physical and biological sciences. To-day the President usually restricts himself to specialities connected with his own work or deals with questions which for the time are uppermost. To be President of the British Association is undoubtedly a great honour. It is also a great opportunity and a great responsibility, for I know that, on the wings of the Press, my words, be they worthy or not, will be carried to all points of the compass. I propose first to deal with the important question of the supply of bread to the inhabitants of these islands, then to touch on subjects to which my life work has been more or less devoted. I shall not attempt any general survey of the sciences; these, so far as the progress in them demands attention, will be more fitly brought before you in the different sections either in the Addresses of the Presidents or in communications from members. Before proceeding with my address I wish to refer to the severe loss the British Association has sustained in the death of Lord Playfair. With Sir John Lubbock and Lord Rayleigh, Lord Playfair was one of the permanent trustees of our Association and for many years he was present at our meetings. It would be difficult to over-rate his loss to British science. Lord Playfair's well-matured and accurate judgment, his scientific knowledge, and his happy gift of clothing weighty thoughts in persuasive language made his presence acceptable, whether in the council chamber, in departmental inquiries, or at light social gatherings, where by the singular laws of modern society momentous announcements are sometimes first given to the world. Lord Playfair (then Sir Lyon Playfair) was President of the British Association at Aberdeen in 1885; his address on that occasion will long be remembered as a model of profound learning and luminous exposition.

And now I owe a sort of apology to this brilliant audience. I must ask you to bear with me for ten minutes, for I am afraid what I now have to say will prove somewhat dull. I ought to propitiate you, for, to tell the truth, I am bound to bore you with figures. Statistics are rarely attractive to a listening audience, but they are necessary evils, and those of this evening are unusually doleful. Nevertheless, when we have proceeded a little way on our journey I hope you will see that the river of figures is not hopelessly dreary. The stream leads into an almost unexplored region and to the right and left we see channels opening out, all worthy of exploration and promising rich reward to the statistic explorer who will trace them to their source—a harvest, as Huxley expresses it, "immediately convertible into those things which the most sordidly practical of men will admit to have value—namely, money and life." My chief subject is of interest to the whole world, to every race, to every human being. It is of urgent importance to-day and it is a life and death question for generations to come—I mean the question of food-supply.

I.—THE WHEAT-SUPPLY OF THE WORLD.

Many of my statements you may think are of the alarmist order; certainly they are depressing, but they are founded on stubborn facts. They show that England and all civilised nations stand in deadly peril of not having enough to eat. As mouths multiply food resources dwindle. Land is a limited quantity and the land that will grow wheat is absolutely dependent on difficult and capricious natural phenomena. I am constrained to show that our wheat-producing soil is totally unequal to the strain put upon it. After wearying you with a survey of the universal dearth to be expected I hope to point a way out of the colossal dilemma. It is the chemist who must come to the rescue of the threatened communities. It is through the laboratory that starvation may ultimately be turned into plenty.

The Food-supply of Great Britain.

The food-supply of the kingdom is of peculiar interest to this meeting, considering that the grain trade has always been, and still is, an important feature in the imports of Bristol. The imports of grain to this city amount to about 25,000,000 bushels per annum, 8,000,000 of which consist of wheat. What are our home requirements in the way of wheat? The consumption of wheat per head of the population (unit consumption) is over 6 bushels per annum; and taking the population at 40,000,000 we require no less than 240,000,000 bushels of wheat, increasing annually by 2,000,000 bushels, to supply the increase of population. Of the total amount of wheat consumed in the United Kingdom we grow 25 and import 75 per cent. So important is the question of wheat-supply that it has attracted the attention of Parliament and the question of national granaries has been mooted. It is certain that in case of war with any of the great powers wheat would be contraband, as if it were cannon or powder liable to capture even under a neutral flag. We must therefore accept the situation and treat wheat as munitions of war, and grow, accumulate, or store it as such. It has been shown that at the best our stock of wheat and flour amounts only to 64,000,000 bushels—fourteen weeks' supply—while last April our stock was equal to only 10,000,000 bushels, the smallest ever recorded by "Beerbohm" for the period of the season. Similarly, the stocks held in Europe, the United States, and Canada, called "the world's visible supply," amounted to only 54,000,000 bushels, or 10,000,000 less than last year's sum total, and nearly 82,000,000 less than that of 1893 or 1894 at the corresponding period. To arrest this impending danger it has been proposed that an amount of 64,000,000 bushels of wheat should be purchased by the State and stored in national granaries, not to be opened except to remedy deterioration of grain or in view of national disaster rendering starvation imminent. This 64,000,000 bushels would add another fourteen weeks' life to the population; assuming that the ordinary stock had not been drawn on, the wheat in the country would only then be enough to feed the population for twenty-eight weeks. I do not venture to speak authoritatively on national granaries. The subject has been discussed in the daily press and the recently published report from the Agricultural Committee on National Wheat Stores brings together all the arguments in favour of this important scheme, together with the difficulties to be faced if it be carried out with necessary completeness.

More hopeful, although difficult and costly, would be the alternative of growing most, if not all, of our own wheat-supply here at home in the British Isles. The average yield over the United Kingdom last year was 29·07 bushels per acre, the average for the last eleven years being 29·46. For twelve months we need 240,000,000 bushels of wheat, requiring about 8,250,000 acres of good wheat-growing land, or nearly 13,000 square miles, increasing at the rate of 100 square miles per annum, to render us self-supporting as to bread food. This area is about one-fourth of the size of England.[1] A total area of land in the United Kingdom equal to a plot 110 miles square, of quality and climate sufficient to grow wheat to the extent of 29 bushels per acre, does not seem a hopeless demand.[2] It is doubtful, however, if this amount of land could be kept under wheat and the necessary expense of high farming faced except under the imperious pressure of impending starvation or the stimulus of a national subsidy or permanent high prices. Certainly these 13,000 square miles would not be

[1] In preparing the part of this address dealing with the world's supply and demand for wheat and the conclusions thereon I have been materially assisted by Mr. C. Wood Davis of Kansas, U.S.A.

[2] The total area of the United Kingdom is 120,979 square miles; therefore the required land is about a tenth part of the total.

available under ordinary economic conditions, for much, perhaps all, the land now under barley and oats would not be suitable for wheat. In any case, owing to our cold, damp climate and capricious weather, the wheat crop is hazardous and for the present our annual deficit of 180,000,000 bushels must be imported. A permanently higher price for wheat is, I fear, a calamity that ere long must be faced. At enhanced prices land now under wheat will be better farmed and therefore will yield better, thus giving increased production without increased area. The burning question of to-day is, What can the United Kingdom do to be reasonably safe from starvation in presence of two successive failures of the world's wheat harvest or against a hostile combination of European nations? We eagerly spend millions to protect our coasts and commerce, and millions more on ships, explosives, guns, and men, but we omit to take necessary precautions to supply ourselves with the very first and supremely important munition of war—food.

The Bread-Eaters of the World.

To take up the question of food-supply in its scientific aspect I must not confine myself exclusively to our own national requirements. The problem is not restricted to the British Isles—the bread-eaters of the whole world share the perilous prospect—and I do not think it out of place if on this occasion I ask you to take with me a wide, general survey of the wheat-supply of the whole world. Wheat is the most sustaining food grain of the great Caucasian race which includes the peoples of Europe, United States, British America, the white inhabitants of South Africa, Australasia, parts of South America, and the white population of the European colonies. Of late years the individual consumption of wheat has almost universally increased. In Scandinavia it has risen 100 per cent. in 25 years; in Austro-Hungary, 80 per cent.; in France, 20 per cent.; while in Belgium it has increased 50 per cent. Only in Russia and Italy, and possibly Turkey, has the consumption of wheat per head declined. In 1871 the bread-eaters of the world numbered 371,000,000, In 1881 the numbers rose to 416,000,000; in 1891, to 472,600,000; and at the present time they number 516,500,000. The augmentation of the world's bread-eating population in a geometrical ratio is evidenced by the fact that the yearly aggregates grow progressively larger. In the early seventies they rose 4,300,000 per annum, while in the eighties they increased by more than 6,000,000 per annum, necessitating annual additions to the bread-supply nearly one-half greater than sufficed twenty-five years ago. How much wheat will be required to supply all these hungry mouths with bread? At the present moment it is not possible to get accurate estimates of this year's wheat crops of the world, but an adequate idea may be gained from the realised crops of some countries and the promise of others. To supply 516,500,000 bread-eaters, if each bread-eating unit is to have his usual ration, will require a total of 2,324,000,000 bushels for seed and food. What are our prospects of obtaining this amount?

According to the best authorities the total supplies from the 1897-98 harvest are 1,921,000,000 bushels. The requirement of the 516,500,000 bread-eaters for seed and food are 2,324,000,000 bushels; there is thus a deficit of 403,000,000 bushels, which has not been urgently apparent owing to a surplus of 300,000,000 bushels carried over from the last harvest. Respecting the prospects of the harvest year just beginning it must be borne in mind that there are no remainders to bring over from the last harvest. We start with a deficit of 103,000,000 bushels and have 6,500,000 more mouths to feed. It follows, therefore, that one-sixth of the required bread will be lacking unless larger drafts than now seem possible can be made upon early produce from the next harvest. The majority of the wheat crops between 1882 and 1896 were in excess of current needs, and thus considerable reserves of wheat were available for supplementing small deficits from the four deficient harvests. But bread-eaters have almost eaten up the reserves of wheat, and the 1897 harvest being under average the conditions become serious. That scarcity and high prices have not prevailed in recent years is due to the fact that since 1889 we have had seven world crops of wheat and six of rye abundantly in excess of the average. These generous crops increased accumulations to such an extent as to obscure the fact that the harvests of 1895 and 1896 were each much below current requirements. Practically speaking, reserves are now exhausted and bread-eaters must be fed from current harvests—accumulation under present conditions being almost impossible. This is obvious from the fact that a harvest equal to that of 1894 (the greatest crop on record both in acre-yield and in the aggregate) would yield less than current needs. It is clear we are confronted with a colossal problem that must tax the wits of the wisest. When the bread-eaters have exhausted all possible supplies from the 1897-98 harvest there will be a deficit of 103,000,000 bushels of wheat, with no substitution possible unless Europeans can be induuced to eat Indian corn or rye-bread. Up to recent years the growth of wheat has kept pace with demands. As wheat-eaters increased the acreage under wheat expanded. The world has become so familiarised with the orderly sequence of demand and supply, so accustomed to look upon the vast plains of other wheat-growing countries as inexhaustible granaries, that, in a light-hearted way, it is taken for granted that so many million additional acres can be added year after year to the wheat-growing area of the world. We forget that the wheat-growing area is of strictly limited extent and that a few million acres regularly absorbed soon mount to a formidable number.

The Capabilities of the Wheat-growing Countries: the United States.

The present position being so gloomy, let us consider future prospects. What are the capabilities as regards available area, economic conditions, and acreage yield of the wheat-growing countries whence we now draw our supply? For the last thirty years the United States have been the dominant factor in the foreign supply of wheat, exporting no less than 145,000,000 bushels. This shows how the bread-eating world has depended, and still depends, on the United States for the means of subsistence. The entire world's contributions to the food-bearing area have averaged but 4,000,000 acres yearly since 1869. It is scarcely possible that such an average under existing conditions can be doubled for the coming twenty-five years. Almost yearly since 1885 additions to the wheat-growing area have diminished, while the requirements of the increasing population of the States have advanced, so that the needed American supplies have been drawn from the acreage hitherto used for exportation. Practically there remains no uncultivated prairie land in the United States suitable for wheat-growing. The virgin land has been rapidly absorbed until at present there is no land left for wheat without reducing the area for maize, hay, and other necessary crops. It is almost certain that within a generation the ever-increasing population of the United States will consume all the wheat grown within its borders and will be driven to import, and, like ourselves, will scramble for a lion's share of the wheat crop of the world. This being the outlook exports of wheat from the United States are only of present interest and will gradually diminish to a vanishing point. The inquiry may be restricted to such countries as probably will continue to feed bread-eaters who annually derive a considerable part of their wheat from extraneous sources. But if the United States, which grow about one-fifth of the world's wheat and contribute one-third of all wheat exportations, are even now dropping out of the race and likely soon to enter the list of wheat-importing countries, what prospect is there that other wheat-growing countries will be able to fill the gap and by enlarging their acreage under wheat replace the supply which the States have so long contributed to the world's food? The withdrawal of 145,000,000 bushels will cause a serious gap in the food-supply of wheat-importing countries and unless this deficit can be met by increased supplies from other countries there will be a dearth for the rest of the world after the British Isles are sufficiently supplied.

Russia.

Next to the United States Russia is the greatest wheat exporter, supplying nearly 95,000,000 bushels. Although Russia at present exports so lavishly this excess is merely provisional and precarious. The Russian peasant population increases more rapidly than any other in Europe. The yield per acre over European Russia is meagre—not more than 8·6 bushels to the acre—while some authorities consider it as low as 4·6 bushels. The cost of production is low—lower even than on the virgin soil of the United States. The development of the fertile though somewhat overrated "black earth," which extends across the southern portion of the empire and beyond the Ural Mountains into Siberia, progresses rapidly. But, as we have indicated, the consumption of bread in Russia has been reduced to danger point. The peasants starve and fall victims to "hunger

typhus," whilst the wheat-growers export grain that ought to be consumed at home. Considering Siberia as a wheat-grower, climate is the first consideration. Summers are short—as they are in all regions with continental climates north of the 45th parallel—and the ripening of wheat requires a temperature averaging at least 65° F. for from 55 to 65 days. As all Siberia lies north of the summer isotherm of 65° it follows that such region is ill-adapted to wheat culture unless some compensating climatic condition exists. As a fact, the conditions are exceptionally unfavourable in all but very limited districts in the two westernmost governments. The cultivable lands of Western Siberia adapted to grain-bearing neither equal in extent nor in potential productive powers those of Iowa, Minnesota, and Nebraska. There are limited tracts of fair productiveness in Central Siberia and in the valleys of the southern affluents of the Amoor, but these are only just capable of supporting a meagre population. Prince Hilkoff, Russian Minister of Ways and Communications, declared in 1896 that "Siberia never had produced, and never would produce, wheat and rye enough to feed the Siberian population." And a year later Prince Krapotkin backed the statement as substantially correct.

Canada.

Those who attended the meeting of the British Association last year in Canada must have been struck with the extent and marvellous capacity of the fertile plains of Manitoba and the North-West provinces. Here were to be seen 1,290,000 acres of fine wheat-growing land yielding 18,261,950 bushels, one-fifth of which comes to hungry England. Expectations have been cherished that the Canadian North-West would easily supply the world with wheat, and exaggerated estimates are drawn as to the amount of surplus land on which wheat can be grown. Thus far performance has lagged behind promise, the wheat-bearing area of all Canada having increased less than 500,000 acres since 1884, while the exports have not increased in greater proportion. As the wheat area of Manitoba and the North-West has increased the wheat area of Ontario and the Eastern provinces has decreased, the added acres being little more than sufficient to meet the growing requirements of population. We have seen calculations showing that Canada contains 500,000,000 acres of profitable wheat land. The impossibility of such an estimate ever being fulfilled will be apparent when it is remembered that the whole area employed in both temperate zones for growing all the staple food crops is not more than 580,000,000 acres, and that in no country has more than 9 per cent. of the area been devoted to wheat culture. The fertility of the North-West provinces of the Dominion is due to an exceptional and curious circumstance. In winter the ground freezes to a considerable depth. Wheat is sown in the spring, generally April, when the frozen ground has been thawed to a depth of 3 in. Under the hot sun of the short summer the grain sprouts with surprising rapidity, partly because the roots are supplied with water from the thawing depths. The summer is too short to thaw the ground thoroughly and gate-posts or other dead wood extracted in autumn are found still frozen at their lower ends.

Australasia.

Australasia as a potential contributor to the world's supply of wheat affords another fertile field for speculation. Climatic conditions limit the Australian wheat area to a small portion of the southern littoral belt. Professor Shelton considers there are still 50,000,000 acres in Queensland suitable for wheat, but hitherto it has never had more than 150,000 acres under cultivation. Crops in former days were liable to rust, but since the conferences on rust in wheat and the dissemination of instruction to farmers rust no longer has any terrors. I am informed by the Queensland Department of Agriculture that of late years they practically have bred wheat vigorous enough to resist this plague. For the second season in succession the wheat crop last year was destroyed over large areas in Victoria; and in South Australia the harvest averaged not more than about 3¼ bushels per acre after meeting colonial requirements for food and seed, leaving only 684,000 bushels for export. In most other districts the yield falls to such an extent as to cause Europeans to wonder why the pursuit of wheat-raising is continued.

New Zealand has a moist climate resembling that of central and southern England, while South Australia is semi-arid, resembling western Kansas. Only two countries in the world yield as much wheat per acre as New Zealand—these are Denmark and the United Kingdom. Notwithstanding the great yield of wheat, due to an equable climate, New Zealand finds fruit and dairy farming still more profitable. The climatic conditions favourable to wheat are also conducive to luxuriant growths of nutritious grasses. Thus the New Zealander ships his butter more than half way round the world and competes successfully with western Europe.

Austro-Hungary and other European States.

During the last twenty-seven years the Austro-Hungarian population has increased 21·8 per cent., as against an increase of 54·6 per cent. in the acreage of wheat. Notwithstanding this disparity in the rates of increase exports have practically ceased by reason of an advance of nearly 80 per cent. in unit consumption. There can be little doubt that Austro-Hungary is about to enter the ranks of importing nations, although in Hungary a considerable area of wheat land remains to be brought under cultivation.

Roumania is an important wheat-growing country. In 1896 it produced 69,000,000 bushels and exported 34,000,000 bushels. It has a considerable amount of surplus land which can be used for wheat, although for many years the wheat area is not likely to exceed home requirements. France comes next to the United States as a producer of wheat; but for our purpose she counts but little, being dependent on supplies from abroad for an average quantity of 14 per cent. of her own production. There is practically no spare land in France that can be put under wheat in sufficient quantity to enable her to do more than provide for increase of population. Germany is a gigantic importer of wheat, her imports rising 700 per cent. in the last twenty-five years, and now averaging 35,000,000 bushels. Other nations of Europe, also importers, do not require detailed mention, as under no conceivable conditions would they be able to do more than supply wheat for the increasing requirements of the local population, and instead of replenishing would probably diminish the world's stores.

Argentina and Uruguay.

The prospective supply of wheat from Argentina and Uruguay has been greatly overrated. The agricultural area includes less than 100,000,000 acres of good, bad, and indifferent land, much of which is best adapted for pastoral purposes. There is no prospect of Argentina ever being able to devote more than 30,000,000 acres to wheat; the present wheat area is about 6,000,000 acres, an area that may be doubled in the next twelve years. But the whole arable region is subject to great climatic vicissitudes and to frosts that ravage the fields south of the 37th parallel. Years of systematised energy are frustrated in a few days—perhaps hours—by a single cruelty of Nature, such as a plague of locusts, a tropical rain, or a devastating hail storm. It will take years to bring the surplus land of Argentina into cultivation and the population is even now insufficient to supply labour at seed time and harvest. During the next twelve years Uruguay may add 1,000,000 acres to the world's wheat fields; but social, political, and economic conditions seriously interfere with agricultural development.

Africa.

At the present time South Africa is an importer of wheat and the regions suitable to cereals do not exceed a few million acres. Great expectations have been formed as to the fertility of Mashonaland, the Shire Highlands, and the Kikuyu plateau, and as to the adaptation of these regions to the growth of wheat. But wheat culture fails where the banana ripens and the banana flourishes throughout Central Africa except in limited areas of great elevation. In many parts of Africa insect pests render it impossible to store grain and without grain-stores there can be little hope of large exports. North Africa, formerly the granary of Rome now exports less than 5,000,000 bushels of wheat annually, and these exports are on the decline owing to increased home demands. With scientific irrigation Egypt could supply three times her present amount of wheat, although no increase is likely unless the cotton fields of the Delta are diverted to grain-growing. In Algeria and Tunis nearly all reclaimed lands are devoted to the production of wine, for which a brisk demand exists. Were this land devoted to the growth of wheat an additional 5,000,000 bushels might be obtained.

India.

The enormous acreage devoted to wheat in India has been declining for some years and in 1895 over 20,000,000 acres

yielded 185,000,000 bushels. Seven-eighths of this harvest is required for native consumption and only one-eighth on an average is available for export. The annual increase of population is more than 3,000,000, demanding an addition to the food-bearing lands of not less than 1,800,000 acres annually. In recent years the increase has been less than one-fourth of this amount.

In surveying the limitations and vicissitudes of wheat crops I have endeavoured to keep free from exaggeration and have avoided insistance on doubtful points. I have done my best to get trustworthy facts and figures, but from the nature of the case it is impossible to attain complete accuracy. Great caution is required in sifting the numerous varying current statements respecting the estimated areas and total produce of wheat throughout the world. The more closely official estimates are examined the more defective are they found, and comparatively few figures are sufficiently well established to bear the deductions often drawn. In doubtful cases I have applied to the highest authorities in each country and in the case of conflicting accounts have taken data the least favourable to sensational or panic-engendering statements. In a few instances of accurate statistics their value is impaired by age; but for 95 per cent. of my figures I quote good authorities, while for the remaining 5 per cent. I rely on the best commercial estimates derived from the appearance of the growing crops, the acreage under cultivation, and the yield last year. The maximum probable error would make no appreciable difference in my argument.

The Meaning of the Figures.

The facts and figures I have set before you are easily interpreted. Since 1871 unit consumption of wheat, including seed, has slowly increased in the United Kingdom to the present amount of 6 bushels per head per annum; while the rate of consumption for seed and food by the whole world of bread-eaters was 4·15 bushels per unit per annum for the eight years ending 1878, and at the present time is 4·5 bushels. Under present conditions of low acre yield wheat cannot long retain its dominant position among the food-stuffs of the civilised world. The details of the impending catastrophe no one can predict, but its general direction is obvious enough. Should all the wheat-growing countries add to their area to the utmost capacity, on the most careful calculation the yield would give us only an addition of some 100,000,000 acres, supplying at the average world-yield of 12·7 bushels to the acre, 1,270,000,000 bushels, just enough to supply the increase of population among bread-eaters till the year 1931. At the present time there exists a deficit in the wheat area of 31,000 square miles—a deficit masked by the fact that the ten world crops of wheat harvested in the ten years ending 1896 were more than 5 per cent. above the average of the previous twenty-six years. When provision shall have been made, if possible, to feed 230,000,000 units likely to be added to the bread-eating populations by 1931—by the complete occupancy of the arable areas of the temperate zone now partially occupied—where can be grown the additional 330,000,000 bushels of wheat required ten years later by a hungry world? What is to happen if the present rate of population be maintained and if arable areas of sufficient extent cannot be adapted and made contributory to the subsistence of so great a host? Are we to go hungry and to know the trial of scarcity? That is the poignant question. Thirty years is but a day in the life of a nation. Those present who may attend the meeting of the British Association thirty years hence will judge how far my forecasts are justified. If bread fails—not only us, but all the bread-eaters of the world—what are we to do? We are born wheat-eaters. Other races, vastly superior to us in numbers, but differing widely in material and intellectual progress, are eaters of Indian corn, rice, millet, and other grains; but none of these grains have the food value, the concentrated health-sustaining power of wheat, and it is on this account that the accumulated experience of civilised mankind has set wheat apart as the fit and proper food for the development of muscle and brains. It is said that when other wheat-exporting countries realise that the States can no longer keep pace with the demand these countries will extend their area of cultivation and struggle to keep up the supply *pari passu* with the falling-off in other quarters. But will this comfortable and cherished doctrine bear the test of examination? Cheap production of wheat depends on a variety of causes, varying greatly in different countries. Taking the cost of producing a given quantity of wheat in the United Kingdom at 100*s*., the cost for the same amount in the United States is 67*s*., in India 66*s*., and in Russia 54*s*. We require cheap labour, fertile soil, easy transportation to market, low taxation and rent, and no export or import duties. Labour will rise in price and fertility diminish as the requisite manurial constituents in the virgin soil become exhausted. Facility of transportation to market will be aided by railways, but these are slow and costly to construct, and it will not pay to carry wheat by rail beyond a certain distance. These considerations show that the price of wheat tends to increase. On the other hand, the artificial impediments of taxation and customs duties tend to diminish as demand increases and prices rise.

The Chemist to the Rescue.

I have said that starvation may be averted through the laboratory. Before we are in the grip of actual dearth the chemist will step in and postpone the day of famine to so distant a period that we and our sons and grandsons may legitimately live without undue solicitude for the future. It is now recognised that all crops require what is called a "dominant" manure. Some need nitrogens, some potash, others phosphates. Wheat pre-eminently demands nitrogen, fixed in the form of ammonia or nitric acid. All other necessary constituents exist in the soil; but nitrogen is mainly of atmospheric origin, and is rendered "fixed" by a slow and precarious process which requires a combination of rare meteorological and geographical conditions to enable it to advance at a sufficiently rapid rate to become of commercial importance. There are several sources of available nitrogen. The distillation of coal in the process of gas-making yields a certain amount of its nitrogen in the form of ammonia; and this product, as sulphate of ammonia, is a substance of considerable commercial value to gas companies. But the quantity produced is comparatively small; all Europe does not yield more than 400,000 annual tons, and in view of the unlimited nitrogen required to substantially increase the world's wheat crop this slight amount of coal ammonia is not of much significance. For a long time guano has been one of the most important sources of nitrogenous manures, but guano deposits are so near exhaustion that they may be dismissed from consideration.

Much has been said of late years and many hopes raised by the discovery of Hellriegel and Wilfarth that leguminous plants bear on their roots nodosities abounding in bacteria endowed with the property of fixing atmospheric nitrogen; and it is proposed that the necessary amount of nitrogen demanded by grain crops should be supplied to the soil by cropping it with clover and ploughing in the plant when its nitrogen assimilisation is complete. But it is questionable whether such a mode of procedure will lead to the lucrative stimulation of crops. It must be admitted that practice has long been ahead of science and for ages farmers have valued and cultivated leguminous crops. The four-course rotation is turnips, barley, clover, wheat—a sequence popular more than two thousand years ago. On the Continent, in certain localities, there has been some extension of microbe cultivation; at home we have not reached even the experimental stage. Our present knowledge leads to the conclusion that the much more frequent growth of clover on the same land, even with successful microbe-seeding and proper mineral supplies, would be attended with uncertainty and difficulties. The land soon becomes what is called "clover-sick" and turns barren.

There is still another and invaluable source of fixed nitrogen. I mean the treasure locked up in the sewage and drainage of our towns. Individually the amount so lost is trifling, but multiply the loss by the number of inhabitants and we have the startling fact that in the United Kingdom we are content to hurry down our drains and watercourses into the sea fixed nitrogen to the value of no less than £16,000,000 per annum. This unspeakable waste continues and no effective and universal method is yet contrived of converting sewage into corn. Of this barbaric waste of manurial constituents Liebig nearly half a century ago wrote in these prophetic words: "Nothing will more certainly consummate the ruin of England than a scarity of fertilisers—it means a scarcity of food. It is impossible that such a sinful violation of the divine laws of nature should for ever remain unpunished, and the time will probably come for England sooner than for any other country when, with all her wealth in gold, iron, and coal, she will be unable to buy one-thousandth part of the food which she has during

hundreds of years thrown recklessly away." The more widely this wasteful system is extended, recklessly returning to the sea what we have taken from the land, the more surely and quickly will the finite stocks of nitrogen locked up in the oils of the world become exhausted. Let us remember that the plant creates nothing; there is nothing in bread which is not absorbed from the soil, and unless the abstracted nitrogen is returned to the soil its fertility must ultimately be exhausted. When we apply to the land nitrate of soda, sulphate of ammonia, or guano, we are drawing on the earth's capital, and our drafts will not perpetually be honoured. Already we see that a virgin soil cropped for several years loses its productive powers and without artificial aid becomes infertile. Thus the strain to meet demands is increasingly great. Witness the yield of 40 bushels of wheat per acre under favourable conditions dwindling through exhaustion of soil to less than 7 bushels of poor grain, and the urgency of husbanding the limited store of fixed nitrogen becomes apparent. The store of nitrogen in the atmosphere is practically unlimited, but it is fixed and rendered assimilable by plants only by cosmic processes of extreme slowness. The nitrogen which with a light heart we liberate in a battleship broadside has taken millions of minute organisms patiently working for centuries to win from the atmosphere.[3]

Nitrogenous Manures.

The only available compound containing sufficient fixed nitrogen to be used on a world-wide scale as a nitrogenous manure is nitrate of soda, or Chili saltpetre. This substance occurs native over a narrow band of the plain of Tamarugal, in the northern provinces of Chili between the Andes and the coast hills. In this rainless district for countless ages the continuous fixation of atmospheric nitrogen by the soil, its conversion into nitrate by the slow transformation of billions of nitrifying organisms, its combination with soda and the crystallisation of the nitrate have been steadily proceeding, until the nitrate fields of Chili have become of vast commercial importance and promise to be of inestimably greater value in the future. The growing exports of nitrate from Chili at present amount to about 1,200,000 tons. The present acreage devoted to the world's growth of wheat is about 163,000,000 acres. At the average of 12·7 bushels per acre this gives 2,070,000,000 bushels. But thirty years hence the demands will be 3,260,000,000 bushels and there will be difficulty in finding the necessary acreage on which to grow the additional amount required. By increasing the present yield per acre from 12·7 to 20 bushels we should with our present acreage secure a crop of the requisite amount. Now from 12·7 to 20 bushels per acre is a moderate increase of productiveness, and there is no doubt that a dressing with nitrate of soda will give this increase and more. The action of nitrate of soda in improving the yield of wheat has been studied practically by Sir John Lawes and Sir Henry Gilbert on their experimental field at Rothamstead. This field was sown with wheat for thirteen consecutive years without manure and yielded an average of 11·9 bushels to the acre. For the next thirteen years it was sown with wheat and dressed with 5 cwt. of nitrate of soda per acre, other mineral constituents also being present. The average yield for these years was 36·4 bushels per acre—an increase of 24·5 bushels. In other words, 22·86 lb. of nitrate of soda produce an increase of one bushel of wheat. At this rate, to increase the world's crop of wheat by 7·3 bushels about 1½ cwt. of nitrate of soda must annually be applied to each acre. The amount required to raise the world's crop on 163,000,000 acres from the present supply of 2,070,000,000 bushels to the required 3,260,000,000 bushels would be 12,000,000 tons distributed in varying amounts over the wheat-growing countries of the world. The countries which produce more than the average of 12·7 bushels will require less and those below the average will require more; but, broadly speaking, about 12,000,000 tons annually of nitrate of soda will be required, in addition to the 1,250,000 tons already absorbed by the world. It is difficult to get trustworthy estimates of the amount of nitrate surviving in the nitre beds. Common rumour declares the supply to be inexhaustible, but cautious local authorities state that at the present rate of export of over 1,000,000 tons per annum the raw material "caliche," containing from 25 to 50 per cent. nitrate, will be exhausted in from twenty to thirty years. Dr. Newton, who has spent years on the nitrate fields, tells me there is a lower class material, containing a small proportion of nitrate, which cannot at present be used, but which may ultimately be manufactured at a profit. Apart from a few of the more scientific manufacturers no one is sanguine enough to think this debatable material will ever be worth working. If we assume a liberal estimate for nitrate obtained from the lower grade deposit, and say that it will equal in quantity that from the richer quality, the supply may last, possibly, fifty years, at the rate of 1,000,000 tons a year; but at the rate required to augment the world's supply of wheat to the point demanded thirty years hence it will not last more than four years.

[3] Sir Andrew Noble informs me that a first-class battleship would carry about 63 tons of cordite and we may suppose that in a general action 40 tons of this would be expended. Now at Trafalgar Nelson had 27 line-of-battle ships and the allied forces 33. If we suppose a similar number of modern battleships and first-class cruisers to be engaged and each to expend 40 tons of cordite, the total volume of nitrogen set free would be 302,400 cubic metres, or about 390 tons, equivalent to 2300 tons of nitrate of soda.

The Fixation of Nitrogen.

I have passed in review all the wheat-growing countries of the world, with the exception of those whose united supplies are so small as to make little appreciable difference to the argument. The situation may be summed up briefly thus: the world's demand for wheat—the leading bread-stuff—increases in a crescendo ratio year by year. Gradually all the wheat-bearing land on the globe is appropriated to wheat-growing until we are within measurable distance of using the last available acre. We must then rely on nitrogenous manures to increase the fertility of the land under wheat, so as to raise the yield from the world's low average—12·7 bushels per acre—to a higher average. To do this efficiently and feed the bread-eaters for a few years will exhaust all the available store of nitrate of soda. For years past we have been spending fixed nitrogen at a culpably extravagant rate, heedless of the fact that it is fixed with extreme slowness and difficulty, while its liberation in the free state takes place always with rapidity and sometimes with explosive violence. Some years ago Mr. Stanley Jevons uttered a note of warning as to the near exhaustion of our British coalfields. But the exhaustion of the world's stock of fixed nitrogen is a matter of far greater importance. It means not only a catastrophe little short of starvation for the wheat-eaters, but indirectly scarcity for those who exist on inferior grains, together with a lower standard of living for meat-eaters, scarcity of mutton and beef, and even the extinction of gunpowder!

There is a gleam of light amid this darkness of despondency. In its free state nitrogen is one of the most abundant and pervading bodies on the face of the earth. Every square yard of the earth's surface has nitrogen gas pressing down on it to the extent of about seven tons—but this is in the *free* state and wheat demands it *fixed*. To convey this idea in an object lesson I may tell you that, previously to its destruction by fire, Colston Hall, measuring 146 ft. by 80 ft. by 70 ft., contained 27 tons weight of nitrogen in its atmosphere; it also contained one-third of a ton of argon. In the free gaseous state this nitrogen is worthless; combined in the form of nitrate of soda it would be worth about £2000. For years past attempts have been made to effect the fixation of atmospheric nitrogen and some of the processes have met with sufficient partial success to warrant experimentalists in pushing their trials still further; but I think I am right in saying that no process has yet been brought to the notice of scientific or commercial men which can be considered successful either as regards cost or yield of product. It is possible, by several methods, to fix a certain amount of atmospheric nitrogen; but to the best of my knowledge no process has hitherto converted more than a small amount, and this at a cost largely in excess of the present market value of fixed nitrogen. The fixation of atmospheric nitrogen, therefore, is one of the great discoveries awaiting the ingenuity of chemists. It is certainly deeply important in its practical bearings on the future welfare and happiness of the civilised races of mankind. This unfulfilled problem, which so far has eluded the strenuous attempts of those who have tried to wrest the secret from nature, differs materially from other chemical discoveries which are in the air, so to speak, but are not yet matured. The fixation of nitrogen is vital to the progress of civilised humanity. Other discoveries minister to our increased intellectual comfort, luxury, or convenience; they serve to make life easier, to hasten the acquisition of wealth, or to save time, health, or worry. The fixation of

nitrogen is a question of the not far distant future. Unless we can class it among certainties to come the great Caucasian race will cease to be foremost in the world and will be squeezed out of existence by races to whom wheaten bread is not the staff of life.

Let me see if it is not possible even now to solve the momentous problem. As far back as 1892 I exhibited at one of the *soirées* of the Royal Society an experiment on "The Flame of Burning Nitrogen." I showed that nitrogen is a combustible gas, and the reason why when once ignited the flame does not spread through the atmosphere and deluge the world in a sea of nitric acid is that its igniting point is higher than the temperature of its flame—not therefore hot enough to set fire to the adjacent mixture. But by passing a strong induction current between terminals the air takes fire and continues to burn with a powerful flame, producing nitrous and nitric acids. This inconsiderable experiment may not unlikely lead to the development of a mighty industry destined to solve the great food problem. With the object of burning out nitrogen from air so as to leave argon behind Lord Rayleigh fitted up apparatus for performing the operation on a larger scale, and succeeded in effecting the union of 29·4 grammes of mixed nitrogen and oxygen at an expenditure of one horse-power. Following these figures it would require one Board of Trade unit to form 74 grammes of nitrate of soda, and therefore 14,000 units to form one ton. To generate electricity in the ordinary way with steam-engines and dynamos, it is now possible with a steady load night and day, and engines working at maximum efficiency, to produce current at a cost of one-third of a penny per Board of Trade unit. At this rate one ton of nitrate of soda would cost £26. But electricity from coal and steam-engines is too costly for large industrial purposes; at Niagara, where water power is used, electricity can be sold at a profit for one-seventeenth of a penny per Board of Trade unit. At this rate nitrate of soda would cost not more than £5 per ton. But the limit of cost is not yet reached and it must be remembered that the initial data are derived from small scale experiments in which the object was not economy but rather to demonstrate the practicability of the combustion method and to utilise it for isolating argon. Even now electric nitrate at £5 a ton compares favourably with Chili nitrate at £7 10*s.* a ton; and all experience shows that when the road has been pointed out by a small laboratory experiment the industrial operations that may follow are always conducted at a cost considerably lower than could be anticipated from the laboratory figures.

Before we decide that electric nitrate is a commercial possibility a final question must be mooted. We are dealing with wholesale figures and must take care that we are not simply shifting difficulties a little further back without really diminishing them. We start with a shortage of wheat and the natural remedy is to put more land under cultivation. As the land cannot be stretched and there is so much of it and no more, the object is to render the available area more productive by a dressing with nitrate of soda. But nitrate of soda is limited in quantity and will soon be exhausted. Human ingenuity can contend even with these apparently hopeless difficulties. Nitrate can be produced artificially by the combustion of the atmosphere. Here we come to finality in one direction; our stores are inexhaustible. But how about electricity? Can we generate enough energy to produce 12,000,000 tons of nitrate of soda annually? A preliminary calculation shows that there need be no fear on that score; Niagara alone is capable of supplying the required electric energy without much lessening its mighty flow. The future can take care of itself. The artificial production of nitrate is clearly within view and by its aid the land devoted to wheat can be brought up to the 30 bushels per acre standard. In days to come, when the demand may again overtake supply, we may safely leave our successors to grapple with the stupendous food problem. And in the next generation, instead of trusting mainly to food-stuffs which flourish in temperate climates, we probably shall trust more and more to the exuberant food-stuffs of the tropics, where, instead of one yearly sober harvest, jeopardised by any shrinkage of the scanty days of summer weather or of the few steady inches of rainfall, Nature annually supplies heat and water enough to ripen two or three successive crops of food-stuffs in extraordinary abundance. To mention one plant alone, Humboldt—from what precise statistics I know not—computed that, acre for acre, the food-productiveness of the banana is 133 times that of wheat—the unripe banana, before its starch is converted into sugar, is said to make excellent bread. Considerations like these must in the end determine the range and avenues of commerce, perhaps the fate of continents. We must develop and guide Nature's latent energies, we must utilise her inmost workshops, we must call into commercial existence Central Africa and Brazil to redress the balance of Odessa and Chicago.

II.—THE LATEST ACHIEVEMENTS OF SCIENCE.

Having kept you for the last half-hour rigorously chained to earth disclosing dreary possibilities it will be a relief to soar to the heights of pure science and to discuss a point or two touching its latest achievements and aspirations. The low temperature researches which bring such renown to Professor Dewar and to his laboratory in the Royal Institution have been crowned during the present year by the conquest of one of Nature's most defiant strongholds. On May 10th last Professor Dewar wrote me these simple but victorious words: "This evening I have succeeded in liquefying both hydrogen and helium. The second stage of low temperature work has begun." Static hydrogen boils at a temperature of 238° C. at ordinary pressure and at 250° C. in a vacuum, thus enabling us to get within 23° C. of absolute zero. The density of liquid hydrogen is only one-fourteenth that of water, yet in spite of such a low density it collects well, drops easily, and has a well-defined meniscus. With proper isolation it will be as easy to manipulate liquid hydrogen as liquid air. The investigation of the properties of bodies brought near the absolute zero of temperature is certain to give results of extraordinary importance. Already platinum resistance thermometers are becoming useless, as the temperature of boiling hydrogen is but a few degrees from the point where the resistance of platinum would be practically nothing, or the conductivity infinite.

Several years ago I pondered on the constitution of matter in what I ventured to call the fourth state. I endeavoured to probe the tormenting mystery of the atom. What *is* the atom? Is a single atom in space solid, liquid, or gaseous? Each of these states involves ideas which can only pertain to vast collections of atoms. Whether, like Newton, we try to visualise an atom as a hard, spherical body or, with Boscovitch and Faraday, to regard it as a centre of force, or accept the vortex atom theory of Lord Kelvin, an isolated atom is an unknown entity difficult to conceive. The properties of matter—solid, liquid, gaseous—are due to molecules in a state of motion. Therefore, matter as we know it involves essentially a mode of motion and the atom itself — intangible, invisible, and inconceivable — is its material basis and may, indeed, be styled the only true *matter*. The space involved in the motions of atoms has no more pretension to be called matter than the sphere of influence of a body of riflemen — the sphere filled with flying leaden missiles—has to be called lead. Since what we call matter essentially involves a mode of motion, and since at the temperature of absolute zero all atomic motions would stop, it follows that matter as we know it would at that paralysing temperature probably entirely change its properties. Although a discussion of the ultimate absolute properties of matter is purely speculative it can hardly be barren, considering that in our laboratories we are now within moderate distance of the absolute zero of temperature. I have dwelt on the value and importance of nitrogen, but I must not omit to bring to your notice those little known and curiously related elements which during the past twelve months have been discovered and partly described by Professor Ramsay and Dr. Travers. For many years my own work has been among what I may call the waste heaps of the mineral elements. Professor Ramsay is dealing with vagrant atoms of an astral nature. During the course of the present year he has announced the existence of no fewer than three new gases—krypton, neon, and metargon. Whether these gases, chiefly known by their spectra, are true unalterable elements, or whether they are compounded of other known or unknown bodies, has yet to be proved. Fellow workers freely pay tribute to the painstaking zeal with which Professor Ramsay has conducted a difficult research, and to the philosophic subtlety brought to bear on his investigations. But, like most discoverers, he has not escaped the flail of severe criticism. There is still another claimant for celestial honours. Professor Nasini tells us he has discovered, in some volcanic gases at Pozzuoli, that hypothetical element coronium, supposed to cause the bright line 5316·9 in the spectrum of the sun's corona.

Analogy points to its being lighter and more diffusible than hydrogen and a study of its properties cannot fail to yield striking results. Still awaiting discovery by the fortunate spectroscopist are the unknown celestial elements, Aurorium—with a characteristic line at 5570·7—and Nebulum, having two bright lines at 5007·05 and 4959·02.

The fundamental discovery by Hertz of the electro-magnetic waves, predicted more than thirty years ago by Clerk Maxwell, seems likely to develop in the direction of a practical application which excites keen interest—I mean the application to electric signalling across moderate distances without connecting wires. The feasibility of this method of signalling has been demonstrated by several experimenters at more than one meeting of the British Association, though most elaborately and with many optical refinements by Oliver Lodge at the Oxford meeting in 1894. But not until Signor Marconi induced the British Post Office and foreign Governments to try large scale experiments did wireless signalling become generally and popularly known or practically developed as a special kind of telegraphy. Its feasibility depends on the discovery of a singularly sensitive detector for Hertz waves—a detector whose sensitiveness in some cases seems almost to compare with that of the eye itself. The fact noticed by Oliver Lodge in 1889 that an infinitesimal metallic gap subjected to an electric jerk became conducting, so as to complete an electric circuit, was rediscovered soon afterwards in a more tangible and definite form and applied to the detection of Hertz waves by M. E. Branly. Oliver Lodge then continued the work and produced the *vacuum filling-tube* coherers with automatic tapper-back, which are of acknowledged practical service. It is this varying continuity of contact under the influence of extremely feeble electric stimulus alternating with mechanical tremor, which, in combination with the mode of producing the waves revealed by Hertz, constitutes the essential and fundamental feature of "wireless telegraphy." There is a curious and widely spread misapprehension about coherers, to the effect that to make a coherer work the wave must fall upon it. Oliver Lodge has disproved this fallacy. Let the wave fall on a suitable receiver, such as a metallic wire, or, better still, on an arrangement of metal wings resembling a Hertz sender, and the waves set up oscillating currents which may be led by wires (enclosed in metal pipes) to the coherer. The coherer acts apparently by a species of end-impact of the oscillatory current and does not need to be attacked in the flank by the waves themselves. This interesting method of signalling—already developing in Marconi's hands into a successful practical system which inevitably will be largely used in lighthouse and marine work—presents more analogy to optical signals by flash-light than to what is usually understood as electric telegraphy; notwithstanding the fact that an ordinary Morse instrument at one end responds to the movements of a key at the other, or, as arranged by Alexander Muirhead, a syphon recorder responds to an automatic transmitter at about the rate of slow cable telegraphy. But although no apparent optical apparatus is employed, it remains true that the impulse travels from sender to receiver by essentially the same process as that which enables a flash of magnesium powder to excite a distant eye.

The phenomenon discovered by Zeeman that a source of radiation is affected by a strong magnetic field in such a way that light of one refrangibility becomes divided usually into three components, two of which are displaced by diffraction analysis on either side of the mean position and are oppositely polarised to the third or residual constituent, has been examined by many observers in all countries. The phenomenon has been subjected to photography with conspicuously successful results by Professor T. Preston in Dublin and by Professor Michelson and Dr. Ames and others in America. It appears that the different lines in the spectrum are differently affected, some of them being tripled with different grades of relative intensity, some doubled, some quadrupled, some sextupled, and some left unchanged. Even the two components of the D lines are not similarly influenced. Moreover, whereas the polarisation is usually such as to indicate that motions of a negative ion or electron constitute the source of light, a few lines are stated by the observers at Baltimore, who used what they call the "small" grating of 5 in. width ruled with 65,000 lines to be polarised in the reverse way. Further prosecution of these researches must lead to deeper insight into molecular processes and the mode in which they affect the ether; indeed, already valuable theoretic views have been promulgated by H. A. Lorenz, J. Larmer, and G. F. Fitzgerald, on the lines of the radiation theory of Dr. Johnstone Stoney; and the connexion of the new phenomena with the old magnetic rotation of Faraday is under discussion. It is interesting to note that Faraday and a number of more recent experimenters were led by theoretical considerations to look for some such effect; and though the inadequate means at their disposal did not lead to success, nevertheless a first dim glimpse of the phenomenon was obtained by M. Fieves of the Royal Observatory at Brussels in 1885.

The Roentgen Rays.

In the mechanical construction of Roentgen ray tubes I can record a few advances, the most successful being the adoption of Professor Silvanus P. Thompson's suggestion of using for the anti-cathode a metal of high atomic weight. Osmium and iridium have been used with advantage, and osmium anti-cathode tubes are now a regular article of manufacture. As long ago as June, 1896, x ray tubes with metallic uranium anti-cathodes were made in my own laboratory and were found to work better than those with platinum. The difficulty of procuring metallic uranium prevented these experiments from being continued. Thorium anti-cathodes have also been tried. Roentgen has drawn fresh attention to the fact very early observed by English experimenters—that of the non-homogeneity of the rays and the dependence of their penetrating power on the degree of vacuum; rays generated in high vacua have more penetrative power than when the vacuum is less high. These facts are familiar to all who have exhausted focus tubes on their own pumps. Roentgen suggests a convenient phraseology; he call a low vacuum tube, which does not emit the highly penetrating rays, a "soft" tube, and a tube in which the exhaustion has been pushed to an extreme degree, in which highly penetrating rays predominate, a "hard" tube. Using a "hard" tube he took a photograph of a double-barrelled rifle, and showed not only the leaden bullets within the steel barrels but even the wads and the charges. Benoit has re-examined the alleged relation between density and opacity to the rays and finds certain discrepancies. Thus the opacity of equal thicknesses of palladium and platinum are nearly equal, whilst their densities and atomic weights are very different, those of palladium being about half those of platinum. Meantime, while the general opinion of physicists seems to be settling towards a wave or ether theory for the Roentgen rays, an opposite drift is apparent with respect to the physical nature of the cathode rays; it becomes more and more clear that cathode rays consist of electrified atoms or ions in rapid progressive motion. My idea of a fourth state of matter, propounded in 1881,[4] and at first opposed at home and abroad, is now becoming accepted. It is supported by Professor J. J. Thomson[5]; Dr. Larmor's theory[6] likewise involves the idea of an ionic substratum of matter; the view is also confirmed by Zeeman's phenomenon. In Germany—where the term cathode ray was invented almost as a protest against the theory of molecular streams propounded by me at the Sheffield meeting of the British Association in 1879—additional proofs have been produced in favour of the doctrine that the essential fact in the phenomenon is electrified radiant matter. The speed of these molecular streams has been approximately measured chiefly by aid of my own discovery nearly twenty years ago that their path is curved in a magnetic field and that they produce phosphorescence where they impinge on an obstacle. The two unknown quantities, the charge and the speed of each atom, are measurable from the amount of curvature and by means of one other independent experiment. It cannot be said that a complete and conclusive theory of these rays has yet been formulated. It is generally accepted that collisions among particles, especially the violent collisions due to their impact on a massive target placed in their path, give rise to the interesting kind of extremely high frequency radiation discovered by Roentgen. It has, indeed, for some time been known that whereas a charged body in motion constitutes an electric current, the sudden stoppage or any violent acceleration of such a body must cause an alternative electric disturbance which, though so rapidly decaying in intensity as to be practically "dead beat," yet must give rise to an ethereal wave or pulse

[4] Philosophical Transactions, Part 2, 1881, pp. 433-4.
[5] Philosophical Magazine, October, 1897, p. 312.
[6] Ibid., December, 1897, p. 506.

travelling with the speed of light, but of a length comparable to the size of the body whose sudden change of motion caused the disturbance. The emission of a high-pitched musical sound from the jolting of a dustman's cart (with a spring bell hung on it) has been suggested as an illustration of the way in which the molecules of any solid not at absolute zero may possibly emit such rays. If the target on to which the electrically-charged atoms impinge is so constituted that some of its minute parts can thereby be set into rhythmical vibration, the energy thus absorbed reappears in the form of light, and the body is said to phosphoresce. The efficient action of the phosphorescent target appears to depend as much on its physical and molecular as on its chemical constitution. The best known phosphori belong to certain well-defined classes, such as the sulphides of the alkaline-earthy metals, and some of the so-called rare earths; but the phosphorescent properties of each of these groups are profoundly modified by an admixture of foreign bodies—witness the effect on the lines in the phosphorescent spectrum of yttrium and samarium produced by traces of calcium or lead. The persistence of the samarium spectrum in presence of overwhelming quantities of other metals is almost unexampled in spectroscopy; thus 1 part of samaria can easily be seen when mixed with 3,000,000 parts of lime. Without stating it as a general rule it seems as if with a non-phosphorescing target the energy of molecular impact reappears as pulses so abrupt and irregular that, when resolved, they furnish a copious supply of waves of excessively short wave-length—in fact, the now well-known Roentgen rays. The phosphorescence so excited may last only a small fraction of a second, as with the constituents of yttria, where the duration of the different lines varies between the 0·003 and the 0·0009 second; or it may linger for hours, as in the case of some of the yttria earths, and especially with the earthy sulphides, where the glow lasts bright enough to be commercially useful. Excessively phosphorescent bodies can be excited by light waves, but most of them require the stimulus of electrical excitement. It now appears that some bodies, even without special stimulation, are capable of giving out rays closely allied, if not in some cases identical, with those of Professor Roentgen. Uranium and thorium compounds are of this character and it would almost seem from the important researches of Dr. Russell that this ray-emitting power may be a general property of matter, for he has shown that nearly every substance is capable of affecting the photographic plate if exposed in darkness for sufficient time.

No other source for Roentgen rays but the Crookes's tube has yet been discovered, but rays of kindred sorts are recognised. The Becquerel rays, emitted by uranium and its compounds, have now found their companions in rays—discovered almost simultaneously by Curie and Schmidt—emitted by thorium and its compounds. The thorium rays affect photographic plates through screens of paper or aluminium and are absorbed by metals and other dense bodies. They ionise the air, making it an electrical conductor; and they can be refracted and probably reflected, at least diffusively. Unlike uranium rays, they are not polarised by transmission through tourmaline, therefore resembling in this respect the Roentgen rays. Quite recently M. and Madame Curie have announced a discovery which, if confirmed, cannot fail to assist the investigation of this obscure branch of physics. They have brought to notice a new constituent of the uranium mineral pitchblende, which in a 400-fold degree possesses uranium's mysterious power of emitting a form of energy capable of impressing a photographic plate and of discharging electricity by rendering air a conductor. It also appears that the radiant activity of the new body, to which the discoverers have given the name of polonium, needs neither the excitation of light nor the stimulus of electricity; like uranium, it draws its energy from some constantly regenerating and hitherto unsuspected store, exhaustless in amount. It has long been to me a haunting problem how to reconcile this apparently boundless outpour of energy with accepted canons. But, as Dr. Johnstone Stoney reminds me, the resources of molecular movements are far from exhausted. There are many stores of energy in nature that may be drawn on by properly constituted bodies without very obvious cause. Some time since I drew attention to the enormous amount of locked-up energy in the ether; nearer our experimental grasp are the motions of the atoms and molecules, and it is not difficult mentally so to modify Maxwell's demons as to reduce them to the level of an inflexible law and thus bring them within the ken of a philosopher in search of a new tool. It is possible to conceive a target capable of mechanically sifting from the molecules of the surrounding air the quick from the slow movers. This sifting of the swift-moving molecules is effected in liquids whenever they evaporate, and in the case of the constituents of the atmosphere wherever it contains constituents light enough to drift away molecule by molecule. In my mind's eye I see such a target as a piece of metal cooler than the surrounding air acquiring the energy that gradually raises its temperature from the outstanding effect of all its encounters with the molecules of the air about it; I see another target of such a structure that it throws off the slow-moving molecules with little exchange of energy, but is so influenced by the quick-moving missiles that it appropriates to itself some of their energy. Let uranium or polonium—bodies of densest atoms—have a structure that enables them to throw off the slow-moving molecules of the atmosphere, while the quick-moving molecules, smashing on to the surface, have their energy reduced and that of the target correspondingly increased. The energy thus gained seems to be employed partly in dissociating some of the molecules of the gas (or in inducing some other condition which has the effect of rendering the neighbouring air in some degree a conductor of electricity) and partly in originating an undulation through the ether, which, as it takes its rise in phenomena so disconnected as the impacts of the molecules of the air, must furnish a large contingent of light waves of short wave length. The shortness in the case of these Becquerel rays appears to approach without attaining the extreme shortness of ordinary Roentgen rays. The reduction of the speed of the quick moving molecules would cool the layer of air to which they belong; but this cooling would rapidly be compensated by radiation and conduction from the surrounding atmosphere; under ordinary circumstances the difference of temperature would scarcely be perceptible and the uranium would thus appear to perpetually emit rays of energy with no apparent means of restoration. The total energy of both the translational and internal motions of the molecules locked up in quiescent air at ordinray pressure and temperature is about 140,000 foot-pounds in each cubic yard of air. Accordingly the quiet air within a room 12 ft. high, 18 ft. wide, and 22 ft. long contains energy enough to propel a one-horse engine for more than twelve hours. The store drawn upon naturally by uranium and other heavy atoms only awaits the touch of the magic wand of Science to enable the twentieth century to cast into the shade the marvels of the nineteenth.

The Fractionation of Yttria.

Whilst placing before you the labours and achievements of my comrades in science I seize this chance of telling you of engrossing work of my own on the fractionation of yttria to which for the last eighteen years I have given ceaseless attention. In 1883, under the title of "Radiant Matter Spectroscopy," I described a new series of spectra produced by passing the phosphorescent glow of yttria, under molecular bombardment *in vacuo*, through a train of prisms. The visible spectra in time gave up their secrets and were duly embalmed in the Philosophical Transactions. At the Birmingham meeting of the British Association in 1886 I brought the subject before the Chemical Section, of which I had the honour to be President. The results led to many speculations on the probable origin of all the elementary bodies—speculations that for the moment I must waive in favour of experimental facts. There still remained for spectroscopic examination a long tempting stretch of unknown ultra-violet light, of which the exploration gave me no rest. But I will not now enter into details of the quest of unknown lines. Large quartz prisms, lenses, and condensers, specially sensitised photographic films capable of dealing with the necessary small amount of radiation given by feebly phosphorescing substances,[7] and, above all, tireless patience in collating and interpreting results, have all played their part. Although the research is incomplete I am able to announce that among the groups of rare earths giving phosphorescent spectra in the visible region there are others giving well-defined groups of bands which can only be recorded photographically. I have detected and mapped no less than six such groups extending to λ 3060.

[7] In this direction I am glad to acknowledge my indebtedness to Dr. Schuman, of Leipsic, for valuable suggestions and detail of his own apparatus, by means of which he has produced some unique records of metallic and gaseous spectra of lines of short wave-length.

Without enlarging on difficulties I will give a brief outline of the investigation. Starting with a large quantity of a group of the rare earths in a state of considerable purity a particular method of fractionation is applied, splitting the earths into a series of fractions differing but slightly from each other. Each of these fractions, phosphorescing *in vacuo*, is arranged in the spectrograph, and a record of its spectrum photographed upon a specially prepared sensitive film. In this way, with different groups of rare earths, the several invisible bands were recorded—some moderately strong, others exceedingly faint. Selecting a portion giving a definite set of bands, new methods of fractionation were applied, constantly photographing and measuring the spectrum of each fraction. Sometimes many weeks of hard experiment failed to produce any separation and then a new method of splitting up was devised and applied. By unremitting work—the solvent of most difficulties—eventually it was possible to split up the series of bands into various groups. Then, taking a group which seemed to offer possibilities of reasonably quick result, one method after another of chemical attack was adopted, with the ultimate result of freeing the group from its accompanying fellows and increasing its intensity and detail. As I have said, my researches are far from complete, but about one of the bodies I may speak definitely. High up in the ultra-violet, like a faint nebula in the distant heavens, a group of lines was detected, at first feeble and only remarkable on account of their isolation. On further purification these lines grew stronger. Their great refrangibility cut them off from other groups. Special processes were employed to isolate the earth, and using these lines as a test and appealing at every step to the spectrograph, it was pleasant to see how each week the group stood out stronger and stronger, while the other lines of yttrium, samarium, ytterbium, &c., became fainter, and at last practically vanishing left the sought-for group strong and solitary. Finally, within the last few weeks, hopefulness has emerged into certainty and I have absolute evidence that another member of the rare earth groups has been added to the list. Simultaneously with the chemical and spectrographic attack atomic weight determinations were constantly performed. As the group of lines which betrayed its existence stand alone, almost at the extreme end of the ultra-violet spectrum, I propose to name the newest of the elements Monium, from the Greek *μόνος*, alone. Although caught by the searching rays of the spectrum Monium offers a direct contrast to the recently discovered gaseous elements by having a strongly marked individuality; but although so young and wilful it is willing to enter into any number of chemical alliances. Until my material is in a greater state of purity I hesitate to commit myself to figures; but I may say that the wave-lengths of the principal lines are 3120 and 3117. Other fainter lines are at 3219, 3064, and 3060. The atomic weight of the element, based on the assumption of R_2O_3, is not far from 118—greater than that accepted for yttrium and less than that for lanthanum. I ought almost to apologise for adding to the already too long list of elements of the rare earth class—the asteriods of the terrestrial family. But as the host of celestial asteroids, unimportant individually, become of high interest when once the idea is grasped that they may be incompletely coagulated remains of the original nebula, so do these elusive and insignificant rare elements rise to supreme importance when we regard them in the light of component parts of a dominant element, frozen in embryo, and arrested in the act of coalescing from the original protyle into one of the ordinary and law-abiding family for whom Newlands and Mendeleeff have prepared pigeon-holes. The new element has another claim to notice. Not only is it new in itself, but to discover it a new tool had to be forged for spectroscopic research. Further details I will reserve for that tribunal before whom every aspirant for a place in the elemental hierarchy has to substantiate his claim.

III.—THE POSITION OF PSYCHICAL RESEARCH.

These, then, are some of the subjects, weighty and far-reaching, on which my own attention has been chiefly concentrated. Upon one other interest I have not yet touched—to me the weightiest and the farthest reaching of all. No incident in my scientific career is more widely known than the part I took many years ago in certain psychic researches. Thirty years have passed since I published an account of experiments tending to show that outside our scientific knowledge there exists a force exercised by intelligence differing from the ordinary intelligence common to mortals. This fact in my life is of course well understood by those who honoured me with the invitation to become your President. Perhaps among my audience some may feel curious as to whether I shall speak out or be silent. I elect to speak, although briefly. To enter at length on a still debatable subject would be unduly to insist on a topic which—as Wallace, Lodge, and Barrett have already shown — though not unfitted for discussion at these meetings, does not yet enlist the interest of the majority of my scientific brethren. To ignore the subject would be an act of cowardice—an act of cowardice I feel no temptation to commit. To stop short in any research that bids fair to widen the gates of knowledge, to recoil from fear of difficulty or adverse criticism, is to bring reproach on science. There is nothing for the investigator to do but to go straight on, "to explore up and down, inch by inch, with the taper his reason"; to follow the light wherever it may lead, even should it at times resemble a will-o'-the-wisp. I have nothing to retract. I adhere to my already published statements. Indeed, I might add much thereto. I regret only a certain crudity in those early expositions which, no doubt justly, militated against their acceptance by the scientific world. My own knowledge at that time scarcely extended beyond the fact that certain phenomena new to science had assuredly occurred, and were attested by my own sober senses, and, better still, by automatic record. I was like some two-dimensional being who might stand at the singular point of Riemann's surface, and thus find himself in infinitesimal and inexplicable contact with a plane of existence not his own. I think I see a little farther now. I have glimpses of something like coherence among the strange elusive phenomena—of something like continuity between those unexplained forces and laws already known. This advance is largely due to the labours of another association of which I have also this year the honour to be President—the Society for Psychical Research. And were I now introducing for the first time these inquiries to the world of science I should choose a starting-point different from that of old. It would be well to begin with *telepathy;* with the fundamental law, as I believe it to be, that thoughts and images may be transferred from one mind to another without the agency of the recognised organs of sense—that knowledge may enter the human mind without being communicated in any hitherto known or recognised ways.

Telepathy.

Although the inquiry has elicited important facts with reference to the mind it has not yet reached the scientific stage of certainty which would entitle it to be usefully brought before one of our sections. I will therefore confine myself to pointing out the direction in which scientific investigation can legitimately advance. If telepathy take place we have two physical facts—the physical change in the brain of A, the suggester, and the analogous physical change in the brain of B, the recipient of the suggestion. Between these two physical events there must exist a train of physical causes. Whenever the connecting sequence of intermediate causes begins to be revealed the inquiry will then come within the range of one of the sections of the British Association. Such a sequence can only occur through an intervening medium. All the phenomena of the universe are presumably in some way continuous, and it is unscientific to call in the aid of mysterious agencies when with every fresh advance in knowledge it is shown that ether vibrations have powers and attributes abundantly equal to any demand—even to the transmission of thought. It is supposed by some physiologists that the essential cells of nerves do not actually touch, but are separated by a narrow gap which widens in sleep while it narrows almost to extinction during mental activity. This condition is so singularly like that of a Branly or Lodge coherer as to suggest a further analogy. The structure of brain and nerve being similar it is conceivable there may be present masses of such nerve coherers in the brain whose special function it may be to receive impulses brought from without through the connecting sequence of ether waves of appropriate order of magnitude. Roentgen has familiarised us with an order of vibrations of extreme minuteness compared with the smallest waves with which we have hitherto been acquainted and of dimensions comparable with the distances between the centres of the atoms of which the material universe is built up; and

there is no reason to suppose that we have here reached the limit of frequency. It is known that the action of thought is accompanied by certain molecular movements in the brain, and here we have physical vibrations capable from their extreme minuteness of acting direct on individual molecules, while their rapidity approaches that of the internal and external movements of the atoms themselves.

Confirmation of telepathic phenomena is afforded by many converging experiments and by many spontaneous occurrences only thus intelligible. The most varied proof, perhaps, is drawn from analysis of the sub-conscious workings of the mind when these, whether by accident or design, are brought into conscious survey. Evidence of a region below the threshold of consciousness has been presented since its first inception in the Proceedings of the Society for Psychical Research, and its various aspects are being interpreted and welded into a comprehensive whole by the pertinacious genius of F. W. H. Myers. Concurrently our knowledge of the facts in this obscure region has received valuable additions at the hands of labourers in other countries. To mention a few names out of many the observations of Richet, Pierre Janet, and Binet (in France), of Breuer and Freud (in Austria), of William James (in America) have strikingly illustrated the extent to which patient experimentation can probe subliminal processes, and can thus learn the lessons of alternating personalities and abnormal states. Whilst it is clear that our knowledge of subconscious mentation is still to be developed, we must beware of rashly assuming that all variations from the normal waking condition are necessarily morbid. The human race has reached no fixed or changeless ideal; in every direction there is evolution as well as disintegration. It would be hard to find instances of more rapid progress, moral and physical, than in certain important cases of cure by suggestion—again to cite a few names out of many—by Liébeault, Bernheim, the late Auguste Voisin, Bérillon (in France), Schrenck-Notzing (in Germany), Forel (in Switzerland), van Eeden (in Holland), Wetterstrand (in Sweden), Milne Bramwell and Lloyd Tuckey (in England). This is not the place for details, but the *vis medicatrix* thus evoked as it were from the depths of the organism is of good omen for the upward evolution of mankind.

Modern Observation of Elusory Phenomena.

A formidable range of phenomena must be scientifically sifted before we effectually grasp a faculty so strange, so bewildering, and for ages so inscrutable, as the direct action of mind on mind. This delicate task needs a rigorous employment of the method of exclusion—a constant setting aside of irrelevant phenomena that could be explained by known causes, including those far too familiar causes, conscious and unconscious fraud. The inquiry unites the difficulties inherent in all experimentation connected with *mind*, with tangled human temperaments and with observations dependent less on automatic record than on personal testimony. But difficulties are things to be overcome even in the elusory branch of research known as Experimental Psychology. It has been characteristic of the leaders among the group of inquirers constituting the Society of Psychical Research to combine critical and negative work with work leading to positive discovery. To the penetration and scrupulous fairmindedness of Professor Henry Sidgwick and of the late Edmund Gurney is largely due the establishment of canons of evidence in psychical research which strengthen while they narrow the path of subsequent explorers. To the detective genius of Dr. Richard Hodgson we owe a convincing demonstration of the narrow limits of human continuous observation. It has been said that "Nothing worth the proving can be proved nor yet disproved." True though this may have been in the past it is true no longer. The science of our century has forged weapons of observation and analysis by which the veriest tyro may profit. Science has trained and fashioned the average mind into habits of exactitude and disciplined perception, and in so doing has fortified itself for tasks higher, wider, and incomparably more wonderful than even the wisest among our ancestors imagined. Like the souls in Plato's myth that follow the chariot of Zeus, it has ascended to a point of vision far above the earth. It is henceforth open to science to transcend all we now think we know of matter and to gain new glimpses of a profounder scheme of Cosmic Law. An eminent predecessor in this chair declared that "by an intellectual necessity he crossed the boundary of experimental evidence, and discerned in that matter, which we in our ignorance of its latent powers, and notwithstanding our professed reverence for its Creator, have hitherto covered with opprobrium, the potency and promise of all terrestrial life." I should prefer to reverse the apophthegm and to say that in life I see the promise and potency of all forms of matter.

In old Egyptian days a well-known inscription was carved over the portal of the temple of Isis: "I am whatever hath been, is, or ever will be; and my veil no man hath yet lifted." Not thus do modern seekers after truth confront nature—the word that stands for the baffling mysteries of the universe. Steadily, unflinchingly, we strive to pierce the inmost heart of nature, from what she is to reconstruct what she has been and to prophesy what she yet shall be. Veil after veil we have lifted and her face grows more beautiful, august, and wonderful with every barrier that is withdrawn.

An Essay
ON
THE MARRIAGE OF THE UNFIT.[1]

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THE fitness of two individuals to marry embraces two considerations—their fitness as regards each other and their fitness as regards the production and rearing of offspring. Fitness of the former kind implies mental suitableness and also, where there are no private means, the ability of the one or the other to make the necessary provision; except when this is necessary physical health, desirable though it may be, is not an essential. There may be a "marriage of true minds" without it. It is not this kind of fitness which I propose to discuss, nor the ability of parents to rear children—i.e., properly to provide for and educate them, which is a separate question altogether and a very wide one—but rather the fitness to produce children who shall reach a certain level of mental and bodily excellence.

When men come to understand the potency of heredity the question of marital fitness will receive more attention, and they will begin to realise that the responsibility of making a life is scarcely less tremendous than that of taking it. As it is, one of the last things that occur to a marrying couple is whether they are fit to be represented in posterity. I know of few things more remarkable than the extreme self-complacency of human beings (and these often the most unfit) in this respect. Yet even as things now stand the physician is not infrequently called upon to decide whether individuals are fit as regards the production of children, and in view of the enormous responsibility thus thrown upon him it behoves him to be ready with a well-formed judgment in such cases. That they will come before us more and more in the future is to be both hoped and expected, and it is with the view to help to create a proper public opinion on these matters that I bring this subject before the profession.

In order that we may gain a philosophic insight into our subject we must understand the mode in which the human race is evolving and the part which heredity plays in shaping structure and causing disease.

We have still much to learn concerning the factors which determine animal evolution, but almost all are agreed that the principle of the "survival of the fittest" plays a predominant part in it. While it is a fact that the environment tends to mould the organism adaptively, in such a way, namely, that the latter becomes adapted to the environment, it seems very doubtful whether the direct action of the environment plays a decided part in animal evolution, because environmental mouldings (as we may term them) do not appear to be inherited. At any rate, no unmistakeable instance of the inheritance of an acquired character has yet been observed. It is therefore probable that organic evolution does not take place, or takes place only in a very slight

[1] Founded upon a paper read before the Watford Medical Society on April 1st, 1898.

degree, by a summation through successive generations of environmental mouldings. I need scarcely say how unwillingly one comes to this conclusion, for the old Lamarckian school, of which Herbert Spencer is the ardent apostle, held out the promise of great things. What might we not achieve by the continued inheritance of beneficial acquisitions? But this dream, so fondly clung to by our grand old thinker, is apparently but a dream, and it would seem that we must look for progress, not by direct equilibration, as he terms it, but by indirect, in other words by natural selection. Now this selection is of two kinds (*a*) sexual, of which I do not propose to say anything here save that the whole question of marrying is one of proper sexual selection, and (*b*) natural selection commonly so-called, or the survival of the fittest. Since animals tend to increase in geometric ratio, and since there is only room for a certain number, a struggle for existence ensues resulting in the survival of the most fit. Any animal possessing an attribute giving it an advantage over its fellows tends to be selected, and seeing that this beneficial attribute tends to be inherited, it is clear that a species may in this way be considerably modified in the course of several generations, just as happens in the case of the artificial selection practised by breeders of domestic animals.

The tendency of organisms to increase in geometric ratio is not, however, the only cause of natural selection. In the first place the environment is always changing, and this involves the continued readjustment to it of successive generations, by a survival of those individuals varying in suitable directions. But even were the environment unchanging, and were there no geometric increase, natural selection would still be needful in order to maintain adaptation owing to the law of deterioration. Natural selection, in short, has not done its work when it has achieved adaptation to a certain environment; its continued operation is needful in order to maintain a certain level of excellence, otherwise racial deterioration must ensue. Natural selection thus operating has been termed "panmixia." The offspring of even the most perfectly adapted parents are not all alike, but vary round a certain standard of excellence. Some fall short of it, and these require to be weeded out if the standard is to be maintained. Take as an instance the case of eyesight. In order to maintain this at a high standard there must be a continual elimination of individuals with defective sight. Among savage peoples even moderate degrees of short sight place the individual at a great disadvantage in the hunt and the fight, and tend to his premature death, thus preventing him from leaving progeny with the like defect. And what is true of the organs of sight applies to all the organs of the body—they are all liable to fall short of the standard of excellence, and panmixia is needful to the maintenance of that standard.

The tendency of species to increase in geometric ratio, the changeableness of the environment from generation to generation, and the occurrence of variations which fall short of the standard of excellence—these, then, are the factors which start the operation of natural selection. The first of them has little direct effect upon selection among civilised communities, since in their case food is placed within the reach of practically all, and those unable to procure food for themselves do not die as they would under more primitive conditions; but elimination from other causes is still busily at work among us. *Every death not due to accident or old age is really the elimination of an unfit variation*, and occurring before the end of reproductive life falls under the category of natural selection.

A word as to elimination due to changing environment. We are surrounded by vast armies of pathogenic organisms. Did they but remain unchanged we should sooner or later become adapted to them (as we should to any environment not fatal to the entire race) by the continued elimination of those of us least able to resist them; but these organisms being living are ever varying like ourselves and adapting themselves to new conditions, and consequently we never can become adapted to them all. We may possibly succeed in becoming adapted to some species and in starving out others, but depend upon it mankind will always be liable to germ diseases, let nature strive how she may to bring about adaptation to the organisms causing them, and we may be sure that untold millions will be sacrified in the attempt.

Next as to elimination by panmixia. The wonder is, if we come to think of it, not that it should operate, but that its operation should not be much more stringent than it actually is. Think for a moment of the marvellous complexity of the human organisation. Take any limited branch of physiology, make a life-long study of it, and every day will increase your wonder at the intricate adjustment of means to ends. Whether we study the physiology of the heart and vascular system, of phagocytes, or of sugar metabolism, or whether we contemplate the mysterious cerebral processes which underlie the operations of mind, we shall be equally impressed with the fact; and when once imbued with it we can only marvel that our hearts and vaso-motor systems, our phagocytes, sugar-forming organs, and brains serve us so well as they do, and that more of us do not suffer from palpitations, flushings, defective phagocytosis, diabetes, and insanity than is actually the case. How is this high level of excellence maintained? The answer is, By panmixia. If panmixia is needed in order to keep the several parts of the eye so nicely adjusted as to render accurate accommodation possible, must it not also be necessary in order to maintain the same level of excellence in respect of the cardio-vascular system, the phagocytes, and the tissues which subserve the glycogenic and kindred functions? As a matter of fact, defects in these systems constantly occur: a certain number of people do get serious heart disturbances, do get diabetes, do suffer from defective phagocytosis, and do go mad, and all such tend to get eliminated by the action of panmixia. The defects may, however, not be sufficiently great to lead to death. Many suffer from wretched health even when placed under the most favourable conditions. I am thinking especially of the large army of neurotics and hypochondriacs who, though life is but a misery to them, yet do not die and who thus escape the operation of panmixia. Nevertheless, it cannot but be supposed that under more primitive conditions it would operate among them.

This leads me to refer more at length to the interference with the operation of natural selection among civilised communities, for though, as I have said, natural selection is actively operating among them, it is of course to a large extent interfered with. Many lives are saved which would otherwise succumb through incapacity to cope with the environment. If every individual had to provide for himself, a large number would succumb who now live by the sufferance of their fellows. Some would succumb through not having sufficiently keen senses—hearing, eyesight; others through being crippled in their limbs; more from general weakness; others again from strangulated hernias, ovarian cysts, and so forth. These are now in numberless cases saved, and are thus enabled to have children who tend to inherit the like defects. Hence it follows that these defects are continually increasing among the civilised, and that the level of physical perfection among them is lower than among primitive communities, and if the present state of things continues, it must go on getting lower still.

I am tempted here to refer briefly to another interference with the operation of selection among the civilised. Among primitive communities polygamy generally prevails. Those members of a savage tribe who by their mental and physical superiority are able to raise themselves to the rank of chiefs secure the largest number of wives and leave the largest number of children to inherit the paternal excellences. Now while as a sociologist I am dead against polygamy, as a biologist I confess (at the risk of being accused of regarding humanity from the point of view of a stud-groom, as some one has put it) I cannot but regret its complete abolition. I would like to see our giant intellects and champion athletes leave a numerous progeny.

To turn now to the question of heredity. It is very necessary that we should understand its potency. The structure of an individual depends almost wholly upon it. The power of natural selection to mould a species presupposes its influence, for it assumes that the individual "selected" will transmit his peculiarities to his offspring. Let us ever remember that what we are, whether fair-skinned or dark-skinned, long-nosed or short-nosed, big-brained or little-brained, depends essentially upon our parentage. The influence of heredity in disease is vast, much greater, in my opinion, than must medical men deem it to be. In the text-books we are told that one disease is hereditary, 30 per cent., another 10 per cent., while a third disease is not hereditary at all. Not hereditary? I maintain that all diseases are hereditary: *you cannot eliminate the influence of heredity* from any disease, and I will prove it. What is disease? It

is abnormal life. And what is life? It consists of an interaction between the individual and his environment; therefore disease is an abnormal interaction between the two. It follows that you cannot possibly eliminate the part played by the individual from the causation of any disease, since it is *his structure which determines whether he shall or shall not react abnormally to a given environment.* Now his structure is essentially determined by heredity. I have therefore proved my point. This is no mere logical quibbling but a practical fact. I will test my position by taking a disease with which most people will probably say heredity has nothing at all to do—the wheal caused by flea-bite. This affection depends upon the morbid interaction of the host and the specific environment constituted by the poison with which the parasite inoculates him. As everyone knows, the liability to be flea-bitten and the tendency to suffer from wheals when thus bitten, differ greatly in different individuals. Some suffer little or not at all in this way; others grievously. Upon what does this difference depend? It depends upon differences in the organisation or structure of the host, and these differences are essentially determined by heredity. Hence all parasitic diseases, from a flea-bite to pulmonary consumption, from typhoid to malignant tumour, are hereditary. Such diseases depend upon defect in the organism as regards some specific environment, but others, such as chronic Bright's disease, diabetes, ovarian cyst, strangulated hernia, may occur independently of any specific environment, and it is obvious that these are *a fortiori* hereditary.[2]

To reiterate briefly the chief conclusions we have arrived at. There seems good reason to believe that organic evolution proceeds essentially by a survival of the fittest, and that all further evolution of man must take place essentially by the operation of this process. Natural selection is needful not only to *attain* adaptation of the individual to his environment but also to *maintain* it. Structure is chiefly determined by heredity, and seeing that disease is a morbid interaction between the individual and his environment and that his structure determines whether he shall or shall not react abnormally to a given environment, it follows that the factor of heredity cannot be eliminated from the causation of any disease.

We are now in some sort of a position to answer the question: Who are unfit to marry and have children? A question I can only very briefly answer in a paper like the present. We have seen that panmixia is largely interfered with in civilised communities, with the result that racial deterioration must inevitably be in progress, and will disastrously continue unless some new means is discovered by which man's present level of adaptation to his environment can be maintained. Happily, we have such a means to hand, and it is from among those very forces of progress wherein, as we have seen, arises his danger, that his safety also is to be found. For the leavening influence of high ideals for nearly 2000 years has had its effect, and modern progress, modern civilisation, tend more and more consciously or unconsciously, and whether we recognise it or not, towards altruism; it has already widened out man's conception of the duty he owes his neighbour until that duty has come to mean, to those at least who "feed the high tradition of the world," the service of humanity at large, and more enlightenment as to his undoubted responsibility to posterity will show him that that service does not end with the present generation but reaches forward to a future to which we can set no limits. Fortified with the conviction that generations yet unborn have also a claim upon him, a man could of his own free choice do far more than the blind working out of natural laws has ever done, or ever can do, to stamp out the tendency to disease and to perpetuate a healthy race. For all that is needed to enable panmixia to proceed as beneficially as ever, and that without the ruthless destruction of the unfit which obtains when natural selection works unchecked, is for those who have defects *which under natural conditions would lead to annihilation* to forbear to procreate. As beneficially, did I say? Nay, very much more beneficially, for not only could those who are already marked by disease refrain from marrying, but those also who as judged by their family history are likely to become ultimately the victims of serious disease. And if it be urged that such a self-denying ordinance presupposes a higher ethical development than the generality of men have at present attained, that by no means disproves my contention; it only proves that much has yet to be done to get a sound public opinion, a sensitive public conscience, on these matters, such an opinion and such a conscience as I hold it to be one of our first duties to strive to create. Meantime, I doubt much whether the renunciation would be felt to be so very great if men's minds were trained to realise all the issues that are involved, and if it were plainly shown, as it might be, that the sum total of human happiness would be increased by it. What I do recognise is that it must take time for society to get out of the old grooves of thought, sanctioned by almost the whole of our current fiction, as to marrying and giving in marriage, and that while it is getting out of them there must be at times personal suffering, stress and conflict where strong feeling is involved. But all progress is obtained at some sacrifice, the first steps in a reforming movement nearly always cost someone dear, and I can imagine a state of society gradually evolving out of this transition period in which there shall be such a sound healthy view of the responsibilities of marriage that the idea of any union that would be at all likely to involve the survival of the unfit would not be entertained for one moment, and where consequently, there would not be felt to be any renunciation to make, any more than there is now in keeping within the prohibited degrees of the prayer-book and not marrying one's grandfather or grandmother. It is a notable and I think hopeful sign of the times that in a recent novel by Robert Buchanan, in which the reader is introduced to the twenty-first century, he assumes that by a careful elimination of the unfit a state of physical perfection has been achieved. The markedly unfit are disposed of in the chamber of Euthanasia and man and woman may not "under any circumstances come together in lawful wedlock without a certificate of physical perfection from the Holy Office of Health." Now though the time is far yet when men will submit to State coercion in such matters, it is not therefore too soon to urge their responsibility upon them, and everything that will awaken them to it, whether from the press or the pulpit, is to be welcomed.

Let us now consider under what circumstances the physician ought to use his influence to prevent marriage. In certain cases there can be no doubt as to the course he should take. Such serious diseases as pulmonary consumption, organic heart disease, epilepsy, insanity, diabetes, and chronic Bright's disease, are obvious bars to m rriage. Not only the present existence of any one of these diseases, but the having had it and recovered from it, would in my opinion constitute unfitness. The same restriction applies, I think, to rheumatic fever (certainly if there has been more than one attack) and to most cases of acute Bright's disease not due to scarlet fever, especially when the inflammation has been of more than two months' duration.

There are other disorders equally serious in themselves but the having suffered from which is not usually regarded as a bar to marriage. I allude to all those cases of non-accidental disease in which life is saved by the surgeon's skill. Most if not all individuals of this class should be regarded as unfit for procreation. Take the case of a person with strangulated hernia or ovarian cyst. In a less artificial condition of existence such a one would be weeded out as unfit and thus prevented from transmitting to others the like defect. Let us use all the means at our command to rescue such from death, but it must be upon the clear understanding that no children shall be born to them afterwards. Think of the millions and millions of women suffering from ovarian cyst whom nature has in the past sacrificed with a cruel kindness, in order to keep up a certain level of ovarian fitness in the race. These are practically all saved now in civilised communities, with the result that the percentage of ovarian cysts is necessarily increasing. It can only be because medical men do not realise the potency of heredity that they sanction the propagation of children by women whose lives have been saved in this way.

In cases of the class just referred to there can be no doubt about our course, but in other and kindred cases we may find it more difficult to decide what to do. We cannot rely on the rule—in the main a safe one and which I believe should always form the basis on which our own judgment rests—that those with some defect which under primitive conditions would lead to destruction should refrain from marriage. To take an example, a person with a bad error of refraction can be made to see well with glasses and may become a very useful citizen, and although we cannot but regard with regret and misgiving the increasing defect of vision which is

[2] I have discussed the influence of heredity in disease in my work, "The Causation of Disease," p. 318, *et seq.*

taking place in consequence of the interference with panmixia in this one single class of cases only, it would need more boldness than most of us possess to advise a person to refrain from marriage on account of such defect alone. We should be merely laughed at. With congenital defect of hearing the case is different. There we can speak with authority: none such should procreate.

I now come to a particular class of disorders which I think should beyond almost all others be regarded as a bar to marriage. I mean functional disorders of the nervous system. The highly sensitive are not suited for this hard world. Its strenuous conditions call for men of iron nerve and stout hearts. I fear it must be acknowledged that as regards happiness—which at any rate from the purely physical point of view may perhaps be fairly looked upon as our being's end and aim—the fine animal with little imagination and a good thick skin has the best time of it here—is the most truly "fit." It may be that such a one cannot rise to the same heights of happiness as his more nervous and imaginative brother; but, on the other hand, he is incapable of sinking into the same depths of wretchedness. The future has no terrors for him, for he has no imagination to depict it; he lives in the enjoyment of the present, and even when afflicted with the gravest organic disease he suffers very little as compared with people of weak nerves, whose lives are often one long-drawn-out misery. In this latter class I include not only those who suffer from continual headache, noises in the ears, depression of spirits, and so forth, but the hysteric and hypochondriac class also. To the neurotic man as well as to all of these I should say, "Remain single." He is often advised to marry on the ground that wife and children will draw him out of himself, and so far the advice is doubtless good, but I fail to see what right we have to sacrifice the prospective wife and children. I have seen too much home misery caused by neurotic parents to connive at such an arrangement.

In testing an individual's fitness to marry we have to consider not only his past history and his present state, but his probable future as judged by his family history, and this enables us, as already observed, to be more searching than even natural selection. Among the many evils which it would be possible greatly to diminish, if not to eradicate, by obeying the warnings furnished by family history are apoplexy and premature senility. Seeing that deaths from these causes do not as a rule occur until after the procreatic age—i.e., until after the individual has had the opportunity of leaving a full complement of children—such deaths leave little direct impress upon the race. In regard to the staving off of senility I hold it to be well within our province to attempt to do so. The fate of the man in his sixties who, in the zenith of a successful career, or having just settled down to well-earned rest after an anxious and laborious life, is struck down by apoplexy, or who suffers from a general senile breakdown, is surely a tragic one, and I contend that we should wage hot warfare against such occurrences. Some there are whose blood-vessels degenerate, whose hair turns grey, and whose tissues generally show a tendency to senility while yet in their thirties; and on the children of such, especially those who "take after" the prematurely senile parent, we should for the most part urge abstention from marriage. For it is quite remarkable how individuals as they grow old imitate the old age of their parents, sometimes of the one, sometimes of the other. How often does it happen that the young have occasion to criticise the testiness, the ill-nature, or the selfishness of the old. It seems to them quite impossible that they can ever be the same themselves, and yet as the years roll on it too often happens that all the weaknesses of the parent recur with painful exactitude in the child. Indeed, the exactness with which the individual repeats the life history of his progenitors is freshly impressed upon me every day of my life and I often find myself involuntarily forecasting the future of the child by reference to the condition, mental and physical, of the parent. I have in my mind a case in point. Mr. and Mrs. A. are between forty and fifty years of age. Each became decidedly grey before thirty, and as in all such cases each is highly neurotic and has within recent years developed several nervous symptoms. Mr. A., indeed, shows signs of a complete nervous breakdown. Now there are seven children of this marriage from eighteen years of age downwards and they are what would be called remarkably "fine" children; yet it is as certain as anything can well be that the majority of them, if not all, will like their parents become prematurely grey and neurotic. To look at them now without any reference to their family history no one would anticipate this for a moment, but judged in that light it is no mere idle fancy but almost a certainty; and if we were able to prevent marriage in their cases we should be helping towards the elimination of a prematurely senile and neurotic type.

To return, in conclusion, to what I have already touched upon—the difficulty of a practical application of these views. As a general reply to the objections that few are capable of the sacrifice of enforced celibacy where the affections are engaged, and that any interference with marriage on the grounds above given is an undue infringement of the liberty of the subject, I would observe that the life of the individual living in a civilised community is one long-continued self-restraint and that each such individual has very much less freedom of action than is generally supposed. Turn where he may he will find his actions restricted, for, being part of a highly complex social machinery, elaborate rules of conduct are necessarily imposed upon him; mere prudence indeed, compels a man constantly to restrain his natural impulses. And surely when it is realised what are the tremendous issues at stake we may take a higher ground than the ground of mere expediency and appeal to the sense of duty; but it were a very poor and inadequate conception of duty which could content itself with the fulfilment of obligations to the living heedless of those who shall come after. Theft and murder are considered the blackest of crimes, but neither the law nor the church has raised its voice against the marriage of the unfit, for neither has realised that worse than theft and well-nigh as bad as murder is the bringing into the world, through disregard of parental fitness, of individuals full of disease-tendencies. This has been left to our own profession, and we shall be unworthy of its traditions if we do not, each of us in his own particular sphere, strive to bring nearer the day when, not in a heritage of woe but of blessing, the deeds of the fathers shall be visited upon the children unto the third and fourth generation.

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THE CAUSES OF URINARY FEVER AT THE BEGINNING OF CATHETER LIFE.

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MANY years ago Sir Benjamin Brodie drew attention to the very serious symptoms that not infrequently follow the withdrawal of residual urine from the bladder in cases of enlargement of the prostate at the beginning of what has been called "catheter life." Since that time the symptoms have been described by Sir Henry Thompson and by many othe and by nearly every one they have been attributed to the suddenness with which the change is made from the natural and usual mode of micturition to the artificial method. Removing the whole of the residual urine at once and on every occasion of catheterism is most injurious during the first few days. "If the patient has been in the habit of retaining perhaps a pint of urine, or even more, after he has made water it is a serious change for the bladder to be suddenly and completely emptied two or three times a day. The organ soon becomes irritable, the urine is charged with pus, the patient loses appetite and becomes feverish, and there is sometimes considerable danger to life. The rule under such circumstances is to proceed cautiously. Instead of removing the entire quantity leave some urine behind, and thus a compromise is made between the exigencies arising in this condition of the bladder and the usually absolute rule that it should be emptied. Draw off half or only two-thirds of a pint; you will thus relieve the organ partially and in the course of a week or sooner you may gradually accomplish the entire emptying of the bladder and all will probably go well. And it conduces greatly to success to permit no out-door movement to such a patient, but to confine him to his room, in a warm temperature if the weather is cold, or even to his bed for a few days."[1] In the light of the results arrived at by recent

[1] Sir H. Thompson: Clinical Lectures on Diseases of the Urinary Organs, sixth edition, Lecture x., p. 56.

bacteriological researches into the causation of cystitis and urinary fever, it seems to me not altogether inopportune to inquire how far the generally received explanation is correct.

So far as the broader features are concerned the symptoms that present themselves in these cases are remarkably uniform. They do not begin at once. Nearly always some few days elapse before there is anything to excite suspicion. Then the urine becomes cloudy though it may still maintain its acid reaction. A small quantity of albumin, more than can be accounted for by the amount of pus that is present, makes its appearance. Under the microscope there are a few hyaline casts, perhaps a blood corpuscle or two, numerous pus corpuscles, and myriads of bacteria. The specific gravity is lower than it ought to be, and lower than it was before the catheter was used. The total amount passed in the twenty-four hours may either increase until it is as much as seven or eight pints, or diminish until it scarcely reaches twenty ounces. There is seldom any definite rigor but there may be numerous slight chills. The pulse grows more rapid and feeble. The tongue becomes red and dry. There is complete anorexia. Delirium sets in at night, and in a considerable proportion of cases the symptoms rapidly grow worse and worse until, at the end of a few days, the patient sinks into a semi-comatose condition from which he seldom rallies. Post mortem there are all the signs of recent acute cystitis and pyelonephritis. The mucous membrane lining the pelvis and calices of the kidneys, the ureters, and the bladder is swollen and stained by old and recent hæmorrhages, and here and there a thin layer of pus is adherent to it. The pelvis and the ureters are dilated, the apices of the pyramids are eaten away, the cortex is shrunken and hard, the capsule is adherent, and in places between the tubules are minute collections of pus differing in shape and outline according to the anatomical arrangement.

It must be admitted at once that there is a great deal both in the clinical history and in the post-mortem appearances that not only cannot be explained by, but is entirely inconsistent with, the hypothesis of too rapid evacuation. The symptoms do not begin at once, even if the bladder is emptied completely. (I do not include those cases in which fatal syncope is caused by rapidly drawing off a large quantity of residual urine from the bladder when the patient is standing upright; such cases belong to an entirely different class.) The symptoms often do not set in for four or five days. They cannot therefore be explained as the result of shock or of inhibition of the vasomotor nerves of the kidneys. They do not occur when an aspirator is used to relieve retention of urine in prostatic enlargement, even if it is used four or five times, provided always that the patient regains the power of voluntary micturition when the congestion has passed away, and that no catheter is introduced. On the other hand, if the kidneys are sclerosed exactly the same symptoms may occur without any residual urine at all, if a catheter is passed or any operation, such as lithotrity, performed in the bladder; and it cannot be denied that the cause assigned is not reasonably sufficient. Inflammation of the bladder and kidneys may be caused by various agents, but there is absolutely no evidence to support the view that evacuation of the urine is one of them. The wall of the bladder, it is true, is always in a state of atony in such cases, but the pressure of the abdominal viscera from above and the weight of the abdominal wall are more than sufficient to compensate for the loss of tension due to the evacuation of a few ounces of urine. Suppuration, which is invariably present in these cases, both in the bladder and the kidneys, is still more unintelligible. No account whatever is taken of the profuse bacterial growth in the urine and the tissues of the urinary organs. The beginning of it all, the earliest sign that there is anything wrong, is cystitis. It may not appear to be very severe, but it is always there and is always purulent, and caused, therefore, by pyogenic organisms. The symptoms may be slight (probably because the neck of the bladder is not so much involved as the post-prostatic part); the urine may retain its acid reaction; and there may be but little pain and strangury; but there is a distinct floating cloud in the urine, and if the urine is allowed to stand or, better, if it is placed in a centrifugal machine, this cloud condenses into a greyish deposit, which under the microscope consists almost entirely of pus corpuscles and bacteria. The deposit is not mucus. As Traube[2] and Cohnheim[3] long since pointed out there is no such thing as catarrhal cystitis. Cystitis is always purulent. Mucous glands do not exist in the bladder and the epithelium that lines it is never converted into mucus secreting cells as it is in the intestine. The deposit that is usually spoken of as mucus either consists of detached epithelial cells with a few pus corpuscles, or else is simply pus that has been converted into a glairy mass by the alteration in the reaction. If the urine is centrifugalised so as to concentrate the deposit pus corpuscles and bacteria can always be found. Putting aside those forms of inflammation of the bladder that are due to chemical reagents (such as cantharides) and specific organisms (the tubercle bacillus, for example, or the bacillus of typhoid fever, or the gonococcus), cystitis is always purulent, and the immediately exciting cause is invariably the access of pyogenic organisms. And, finally, the symptoms themselves do not present more than a very vague and general resemblance to those that are characteristic of uræmia and suppression of urine. They are essentially the symptoms of a subacute form of septicæmia occurring in a person whose health is broken down by chronic renal degeneration. Comparing them with the results shown by the recent experiments of Albarran and Hallé in France and of Rovsing and Melchior in Denmark, there is no doubt that they are caused by the growth of septic organisms in the urine and the walls of the urinary organs, and that they are to be prevented, not by slowly and gradually reducing the amount of residual urine, but by proper attention to the principles of aseptic catheterism.

The micro-organism that is most frequently present is the bacterium coli commune. It was first described in the urine by Clado[4] as the "bacterium septicum," next by Albarran and Hallé[5] as the bacterium pyogenes. Then almost simultaneously its identity with the bacterium coli was demonstrated by many observers. Albarran and Hallé found it in 47 cases out of 50, and by itself (pure) in 15. Albarran alone found it in 23 out of 25 and pure in 16. Morelle[6] found it in 13 out of 15 and pure in 6, and Melchior[7] found it 24 times out of 35 and pure in 17. In the last two years I have myself examined a very large number of cases and have rarely been able to find it. The next most common is a form of streptococcus, probably identical with the streptococcus pyogenes, and like this organism especially associated with diffuse forms of suppuration and phlebitis; and then one which Melchior identifies with the proteus of Hauser, exceedingly important from the energy with which it causes decomposition of urea. After these there comes a host, as many as thirty different varieties having been described; but probably many of them are the same under different names, and in any case their importance is very much less than that of the three which I have mentioned.

These organisms are always present in inflammation of the bladder. Cystitis (with the exceptions I have mentioned) cannot occur without them. Normally they are not present in the urine or in the bladder. Healthy urine obtained from a healthy bladder with proper precautions to avoid contamination is perfectly sterile. Cultivations give no result. No micro-organisms can be found by the microscope, even after the persistent use of the centrifugal machine. The urine in cases of intra-peritoneal rupture of the bladder does not give rise to peritonitis until secondary changes have developed from the injury sustained by the bladder itself. If the operation is strictly aseptic the urine does not prevent union by the first intention in cases of suprapubic cystotomy. Union by the first intention has even been known to occur after lateral lithotomy. In animals the urine, both that which has descended into the bladder and that which remains in the pelvis of the kidney, is sterile for some time after death; and the few results that have been obtained under similar circumstances in the case of man point in the same direction. Nor does this arise from any resistance offered by the urine to the growth of pathological organisms, or to the fact that the urine never becomes infected. Urine is an excellent nutrient medium, both for those organisms that grow in the presence of air and for those that do best without oxygen. The explanation is that so long as the organs that secrete the urine and retain it are healthy, organisms have no chance of growing in it. They can get into the bladder through the kidneys—for it is well known that the microbes of many infective disorders are discharged in this way—or they may enter it by the urethra, especially

[2] Gesammte Abhandlungen, Band iii., p. 11.
[3] Vorlesungen über Allgemeine Pathologie, 1880, p. 400.

[4] Etude sur une Bactérie Septique de la Vessie, Paris, Steinheil.
[5] Académie de Médecine, Paris, 1888.
[6] Proceedings of the Sixth French Surgical Congress, 1892.
[7] Clystite et Infection Urinaire, Paris, Steinheil, p. 119.

in the case of women, or by some accidental route. Guyon,[8] for example, has published a case in which for weeks together a stream of pus, loaded with virulent micro-organisms, poured through a patient's bladder; but so long as the bladder is healthy and working under healthy conditions, the organisms, no matter what their nature or how great their number, are swept away by the continuous flow before they can take any hold and the contents of the bladder remain aseptic.

The source of these organisms is the urethra: they exist there and in the neighbourhood of the meatus in profusion. Urine passed *per vias naturales* or drawn off in the ordinary way with a catheter is very rarely sterile. Nearly always under either of these conditions cultures may be obtained with ease If the glans penis and the prepuce are thoroughly disinfected beforehand and if an irrigating catheter is passed down to the neck of the bladder and the whole of the canal that lies in front of this is washed out from behind with a strong solution of boric acid, sometimes, then, a perfectly sterile specimen can be obtained. But the only simple method that can be relied upon is that which has been devised by Melchior[9] or a modification of it. Melchior employs a double catheter, one tube lying inside the other. The outer tube has a terminal orifice which is closed by means of a rubber film. The inner tube lies inside this and when the outer is passed down to the neck of the bladder is pushed on through the film, rupturing it as it goes. In this way the inner tube is protected from contact with the micro-organisms that inhabit the urethra, except perhaps at the moment that it bursts through the film, and if the urethra has been washed out first and the instrument sterilised the result can generally be relied upon. The urethra, in short, is full of germs. What Melchior calls the urethral flora is most abundant. Every time urine is passed it washes some of them out and every time a catheter is passed it carries some of them in and, as might be imagined, no antiseptic that can be applied to the surface of the instrument is of the slightest use. If the antiseptic is weak it is no good; if it is strong it does harm by irritating the surface of the mucous membrane; and in either case it is swept off at once by the lips of the meatus or, at the farthest, by the mucous membrane an inch or two down.

Such is the state of things that exists during health. The bladder contains a variable amount of urine that is perfectly sterile. The urethra, especially the anterior part of it, harbours a profusion of septic organisms. The sphincter at the apex of the prostate is the barrier, and so far as the male sex is concerned is capable of preventing the germs getting in of themselves. Whether there is any enlargement of the prostate or collection of residual urine, so far makes no difference. But there is an immense difference as soon as a catheter is passed. Unless special precautions, such as those devised by Melchior, are taken, some of the septic organisms are certain to be carried in by the catheter. It is impossible to prevent it. If the bladder is healthy and capable of emptying itself completely no harm results, the organisms do not get the chance of growing. But on the other hand if the bladder is not capable of emptying itself as it should, if there is any urine left habitually, at once the bacteria begin to increase and multiply, and very soon they spread into the epithelial layer and set up septic cystitis. It is the entrance of these bacteria into the bladder in cases of enlargement of the prostate and residual urine that causes the cystitis, and not the evacuation of the residual urine.

This, however, is not quite all. Residual urine not only favours the occurrence of cystitis by providing a supply of nutrient material in which the germs can grow, but it seems as if it had the power as well of weakening the resistance of the tissues that form the wall of the bladder, so that the bacteria can penetrate more easily. It is true that under certain conditions the bacterium coli may acquire such a degree of virulence as to excite septic inflammation in a healthy and uninjured bladder[10]; but this is not the rule. In general there must be some additional predisposing cause, although be it said, this need often only be of the slightest description. An attack of congestion such as is so common in old men with enlargement of the prostate, bruising the wall of the bladder with a catheter, cold applied to the surface of the abdomen, or temporary retention of urine, is quite enough. The experiments performed by Melchior upon rabbits prove that in them six hours' retention is sufficient to turn the scale. A culture which injected into a rabbit's bladder with the urethra open does no harm, causes intense cystitis if the penis is tied. And Bary[11] has shown that the result is the same if the injection instead of being thrown into the bladder, is thrown into the auricular vein, so that the organisms reach the urine, not directly but through the kidneys. In men with enlargement of the prostate the condition of partial atony that is always associated with residual urine is quite sufficient as the predisposing cause. The nutrition of the epithelium suffers as much as that of the muscular coat; it loses the power of offering an effectual resistance and the septic organisms penetrate more easily and grow more freely.

A striking example of the way in which residual urine prepares the way for cystitis (by its presence, not by its absence) is not uncommonly met with in women. Purulent cystitis, in which the urine is loaded with micro-organisms, sometimes breaks out quite suddenly in women after severe operations, when they are kept lying upon their back for many days together. The muscular power of the bladder is not so great in them as it is in men, for it has not so much work to do, and partly for this reason and partly from the difficulty they experience in micturating when in the recumbent position, women under these circumstances frequently do not empty their bladder thoroughly until they sit up. In other words, there is in them a condition of partial retention similar to that which is present in so many old men with enlargement of the prostate, with, however, one very decided difference. In women it is comparatively easy for germs in the region of the meatus urinarius (where they abound in singular profusion) to gain entry into the bladder; in men it is not. Consequently in the former cystitis without catheterism is common, both conditions are fulfilled, the entry of organisms and the presence of residual urine. In the latter it is altogether exceptional. Fortunately in women the very conditions that render an attack of cystitis so easy are equally energetic in causing it to disappear as soon as the position in altered and they sit upright. Cases of stricture of the urethra in men not uncommonly illustrate the same point. I have known a patient go about for months with his bladder half-way up to his umbilicus and his urine dribbling away from him without a sign of cystitis. The urine when it was drawn off was acid and perfectly clear. In three days' time it was turbid and full of organisms, carried in undoubtedly by the instruments used to dilate the stricture. The bladder was in a state of atony from long-continued over-distension and unable to empty itself, there was a certain amount of residual urine, the epithelial lining was incapable of offering active resistance, the germs spread rapidly into the wall of the bladder, and a very severe attack of cystitis followed. And essentially the same thing happens when the expulsive power of the bladder has been lost in cases of paraplegia due to injury or disease of the spinal cord. The bladder is not emptied thoroughly. Sooner or later germs are carried in by the catheter and cystitis follows. The length of time that elapses from the date of the paralysis to the beginning of the cystitis is a measure of the care that is taken in the treatment of the retention.

One of the chief reasons, I believe, why so little attention has been attracted to the real source and importance of the cystitis that occurs after the removal of residual urine is that the inflammation has not been regarded as septic, because the urine has not undergone ammoniacal decomposition. Urine is often thought to be free from organisms that can do any serious harm, if it is only acid. One of the most valuable results of Melchior's work, and one that is thoroughly borne out by clinical facts, is that the worst forms of septic cystitis and urinary septicæmia may occur independently of ammoniacal decomposition with urine that is distinctly and persistently acid. Ammoniacal decomposition is a very grave addition in cystitis and still more in pyelonephritis, but it is by no means essential. Germs that live in acid urine can and do give rise to toxic products capable of causing intense septicæmia. Some time ago I removed through a perineal incision a small polypoid outgrowth from the region of the neck of the bladder in a patient aged fifty-eight years. The specific gravity of the urine was a little below what it ought to have been and there was a large amount of residual urine in the bladder, 12 oz. at least and sometimes more, but otherwise the patient was

[8] Annales des Maladies des Organes Génito-Urinaires, 1892.
[9] Loc. cit.
[10] Barlow: Archiv für Dermatologie und Syphilographie, 1893.
[11] Annales des Maladies des Organes Génito-Urinaires, 1893, p. 815.

in good condition. The operation was a short one and perfectly successful. As often happens in such cases there was a considerable amount of venous oozing afterwards (although the pedicle had been twisted off) and the blood coagulating in the prostatic urethra caused a good deal of straining. Two days later a rigor set in and from that time during the six weeks that the patient lived the temperature was never normal. No secondary deposits of any kind made their appearance. There was no pneumonia or joint affection, merely exceedingly irregular temperature with rapid emaciation and intense depression. The most noteworthy feature was the extremely offensive character of the motions. Their colour was almost black and the odour intolerable. Nor had any of the drugs that are usually regarded as intestinal antiseptics the least influence over them. There was no albuminuria and no sign of renal infection or of suppression. The quantity of the urine was good and the specific gravity was the same that it had been. Throughout the whole time the urine was acid but it was loaded with long, slender bacilli which, from my later experience in connexion with them, I have little doubt were the bacterium coli and from the intensely offensive character of the intestinal contents a peculiarly virulent form of it. During the straining that followed the operation it seems probable that some of these virulent bacilli were forced into the open ends of the veins at the neck of the bladder and caused general septicæmia. And there can be little doubt that the rigors that occur after internal urethrotomy and after operations upon the kidney involving the opening of large and deep-seated collections of pus (I have known a rigor set in after a pyonephrosis had been explored almost before the patient had been removed from the operating table), are due essentially to the same cause, either the toxic products of the organisms or the organisms themselves being forced into the circulation. On this point, however, there is no need to dwell. The virulent properties that the bacterium coli is capable of developing under certain conditions are well known; and Melchior has shown by experiments upon animals that the products of cultures in urine are as poisonous as those of cultures in broth and other media.

The septic pyelonephritis which is always present in cases that terminate fatally after the withdrawal of residual urine is the natural sequence of the septic cystitis. Perhaps it sets in all the sooner because the ureters are so frequently dilated and because their terminations in the bladder are so often covered with the deposit from the urine.

The injurious effect of the habitual presence of a large quantity of residual urine shows itself here, too, as well as in the bladder. The ureters, the pelvis and calices of the kidneys, and the substance of the kidney itself, suffer in a similar manner. Dilatation of the pelvis, and sclerosis and degeneration of the cortex and medulla, are inevitable in cases of long-standing residual urine. Whether the connexion is a mechanical one, in the same way that the connexion between residual urine and enlargement of the prostate is mechanical, or whether, as Albarran[12] believes, the renal degeneration is the product of septic organisms not sufficiently numerous or powerful to cause suppuration is beside the question at the present time. Degeneration is always present, and as in the bladder so in the kidney, the power of resisting the assault of septic organisms possessed by healthy tissues is impaired or lost. The septic organisms spread rapidly from the bladder up the ureters to the pelvis of the kidneys. Thence they work their way either by the lymphatics or through the intertubular spaces into the medulla and cortex, and whenever they are arrested they set up suppuration.

The immediate result is twofold. On the one hand, the function of the kidney is so much interfered with that there is defective elimination of urea and other waste products, sometimes amounting to suppression of urine. On the other hand, there is the more or less rapid absorption of the toxic products of these organisms—products which clinical and experimental evidence alike have shown capable of causing rigors and all the other phenomena of septic intoxication. But no matter which is the more prominent in any individual case it stands out clearly that both are due directly to the septic organisms that have found their way up from the bladder, and that these in their turn have been carried into the bladder from the urethra by catheters. The effect is the result, not of the withdrawal of residual urine rapidly or slowly, but of the introduction of pyogenic organisms (and especially the bacterium coli) under conditions that suit their growth to perfection.

Aseptic catheterism is one of the problems of modern surgery. It is impossible to deal with it fully now, and I will only mention the precautions which I have been constrained to adopt in cases in which there is a large amount of residual urine, and which, so far, have proved successful. All instruments must be disinfected first by boiling. The hands, the prepuce, and the skin of the penis must be cleansed as thoroughly with soap and water as if a surgical operation were going to be performed, and then sponged over with a solution of corrosive sublimate, 1 part in 5000. The glans and the meatus require especial care. An irrigating catheter is then introduced into the fossa navicularis and this part of the canal thoroughly washed out from behind with boric acid. Then the catheter is pushed on into the deep part and the process repeated. Finally Melchior's double catheter is introduced and the urine drawn off. In this way it is possible to obtain a very high degree of asepticity. The lubricant I prefer is lanolin, because it is readily soluble in water, kept aseptic by the addition to it of 1 part in 5000 of corrosive sublimate. Afterwards, and in the case of an old man with enlarged prostate, I try to enforce the same precautions as far as possible; but when catheters have to be passed at frequent intervals the disinfection of the hands, penis, and front part of the urethra will manifestly be never carried out each time. At the outside it will only be done night and morning, and often one has to be content if it is done thoroughly once a day. But catheters can be kept clean. Those made for me by Messrs. Maw, Son, and Thompson, as smooth and as polished on the inner surface as they are on the outer, which were described in THE LANCET of July 6th, 1895, will stand boiling day after day (if they are kept straight while in the boiling water and drained afterwards) and continued immersion in boric acid without injury. Each patient is provided with two of the glass catheter cases devised by Dr. Nicoll of Glasgow. One of these is filled with boric acid lotion for instruments that have been used; the other, provided with a rubber cork as well as a metal cap, is dry and aseptic. These cases are so arranged that they can be hung up in the patient's wardrobe, out of sight and out of dust. No catheter is used more than once a day. As soon as a catheter is withdrawn from the urethra it is dropped into the case filled with boric acid solution and left there. Once a day all the catheters are taken out, boiled for five minutes, and placed in the dry case until required. The plan is not perfect and I have no doubt is capable of improvement, but it works fairly well with an intelligent private patient who can be made to understand the necessity of observing strict precautions. Unfortunately they are not all intelligent, and in the case of a hospital out-patient such a complicated plan is out of the question. The best that can be done is to start such people as well as possible and hope that by degrees they will acquire a certain amount of immunity against the toxins they are bound to absorb. There is a little evidence to show that a certain degree of immunity may be acquired, but I am very sceptical as to its ever being sufficient in the face of a virulent growth, or when the bacterium coli is assisted by other germs such as the streptococcus and the proteus.

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[12] Étude sur le Rein des Urinaires, Paris, Steinheil.

A SERIES OF CASES OF OBSTRUCTIVE DISEASE OF THE LARGE INTESTINE TREATED BY LATERAL ANASTOMOSIS—IN ONE CASE AFTER COLECTOMY.

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SURGEON TO THE ROYAL INFIRMARY, NEWCASTLE-ON-TYNE.

CASE 1. *Malignant growth at the splenic flexure of the colon; lateral anastomosis of the cæcum and the sigmoid by Senn's plates.*—In August, 1894, a man, aged seventy-two years, was admitted into the Newcastle Royal Infirmary, under the care of Dr. Drummond, suffering from obstruction of the large intestine. Symptoms of intestinal trouble had existed for a year and these at the time of admission had

become acute. The abdomen was much distended, the distended and loaded intestines being visible as an oblique ladder. The last motion, which consisted of only a few small scybala, was passed on August 1st, and thereafter signs of obstruction with vomiting became urgent. The patient was transferred to me for operation on August 6th. A constricting mass was found at the splenic flexure of the colon. This was bound down and surrounded by enlarged glands, so that any radical operation was impracticable. A lateral anastomosis was therefore made between the cæcum and the sigmoid, the bowel being first drained and washed out with boric solution. The incision in each portion of the bowel was an inch and a half in length and the junction was effected by Senn's plates and a surrounding row of Lembert sutures. A piece of omentum was wrapped round and fixed as an additional safeguard. Relief to all the symptoms was immediate. The bowels were well moved on the second day and afterwards daily. One of the bone plates passed on the fifth day and the other came away in pieces on the seventh day. He left the hospital on the eighteenth day after the operation expressing himself as feeling quite well, and he continued well throughout the ensuing winter. In the spring of 1895, however, he returned with a renewal of obstructive symptoms. The tumour had greatly enlarged and it now extended across the abdomen from left to right. An exploratory incision into the cavity was made, but nothing could be done to afford relief. He recovered from the operation and the wound being healed he left the hospital, but died soon afterwards.

CASE 2. *Stricture (probably non-malignant) at the hepatic flexure; three attacks of obstruction; lateral anastomosis between the cæcum and the transverse colon.*—The patient, a slight, thin man, forty-nine years of age, but looking older, was seen in September, 1895, with Mr. Galbraith of Gosforth. He had for several days vomited all his food and there had been no action of the bowels. The abdomen was distended and tender all over and the vomit was unmistakeably stercoral, but it was stayed by washing out the stomach and stopping all feeding by the mouth. Food was given by the rectum for several days and then a cautious return was made to stomach feeding. The bowels were in the end moved by enemata and convalescence went on satisfactorily. This attack, which was the first in which the patient was seen, was the third of a similar character which had occurred, the first being in 1887 and the second in 1891. As soon as his strength was sufficiently regained he was admitted into the Newcastle Royal Infirmary for operation. When examined upon admission a small hard nodule could be felt under cover of the outer border of the right rectus at the level of the umbilicus. The operation was performed on Nov. 25th, 1895, the abdomen being opened in the right linea semilunaris. The appendix was first examined and was found to be normal, but the cæcum was much distended, whereas the transverse colon when drawn down was found to be as markedly collapsed. Examination of the intermediate portion of the colon was hindered by extensive and firm adhesions. The cæcum was therefore opened and the finger passed up to a tight stricture which did not admit the fingertip. From the lengthened history of the case—the first attack dating back eight years—and from the absence of any definite growth, it was judged that the stricture was non-malignant. The extent of adhesions would have made the removal of the affected part of the intestine difficult and tedious, and it was therefore resolved to short-circuit by anastomosing the transverse colon to the cæcum. This was done in the way hereafter described, a very free communication being made. The operation gave immediate relief to the abdominal discomfort which previously had been constant. Almost at once flatus was passed freely *per anum*. There was no sickness and therefore food was given by the mouth from the first. The bowels acted of themselves on the third day and recovery was rapid and uneventful. The patient left the infirmary on Dec. 23rd, when he was on full ordinary diet and quite relieved from all his symptoms. Since then he has continued well and has been able to follow his occupation, which involves much knocking about and irregularity of meals. When he was examined quite recently no induration or swelling of any kind was to be found in the abdomen.

CASE 3. *Malignant growth of the cæcum, anastomosis between the ileum and the ascending colon.*—A woman, aged forty-eight years, was admitted into the Newcastle Royal Infirmary in June, 1896, complaining of severe abdominal pains and stoppage of the bowels. On examination a hard fixed mass was found in the right iliac region. On June 11th the abdomen was opened and a growth apparently carcinomatous was found in the cæcum. The growth was irremoveable, and an anastomosis by lateral apposition was therefore made between the ileum and the ascending colon. The patient made a good recovery, and was quite freed from all symptoms of obstruction. She was last seen in October, 1896, when the growth had considerably increased, but although she still suffered from much pain the action of the bowels was regular and sufficient.

CASE 4. *Malignant disease of the cæcum; lateral anastomosis between the ileum and the transverse colon.*—In February, 1896, the patient, a man, aged fifty-three years, noticed a hard lump in the side which was painful on pressure, and there was constant pain in the right side, and much trouble from flatulence. For some time after his admission into the Newcastle Royal Infirmary (in June, 1896) his temperature ran high, suggesting the possibility of the swelling being inflammatory. The tumour extended to within an inch and a half of the umbilicus and downwards to Poupart's ligament. The edges were well defined except below and the skin was moveable over the tumour. The abdomen was opened beyond the margin of the tumour in the right linea semilunaris and the swelling examined. It was found to be a growth involving the cæcum, and not removeable. The ileum was connected by lateral anastomosis to the transverse colon. For a fortnight after the operation the patient went on well. The wound had healed and the dressings were removed. Then the temperature began to rise and he suffered from pain and distension. It was evident that peritonitis had set in, most likely from leakage, and death occurred twenty-four days after the operation. Only a partial examination could be made, and it was therefore difficult to make out the exact condition of the parts, but apparently a rapid extension of the growth had taken place with which the seat of the anastomosis had become involved. At any rate, the junction had at one part given way and death had resulted from septic peritonitis due to the leakage.

CASE 5. *Malignant growth of the splenic flexure; colectomy; lateral anastomosis of the sigmoid and the transverse colon.*—In this case the patient, a woman, aged fifty-six years, had first noticed a lump on the left side below the ribs two years before her admission to the Newcastle Royal Infirmary. It was small at first, but it had gradually increased in size as time went on. She had severe pain, which was worse at night, and there was gradual emaciation and loss of strength. More than once the bowels, always difficult to move, had been obstructed, accompanied with vomiting. Such an attack came on whilst she was in the hospital. When examined on admission a moveable mass was found in the left hypochrondriac region. An operation was therefore performed on July 27th, 1896. The abdomen was opened in the left linea semilunaris and the mass was found to be a growth of the splenic flexure just at the end of the transverse colon. It was attached at a limited point to the greater curvature of the stomach, though the gastric wall did not itself seem invaded by the disease. As the case seemed favourable for colectomy the bowel was divided at a sufficient distance on either side of the tumour, the open ends being clamped with forceps. The growth could then be well drawn down and its adhesion to the stomach wall was peeled off with the finger-nail. The costo-colic ligament attaching it to the diaphragm was next divided. In separating the peritoneum where this was reflected over the pancreas the substance of the gland was torn and the bleeding from the torn surface gave trouble. When the tumour was detached the open end of the transverse colon was closed by a puckering suture of catgut through all layers. The closed end was then well invaginated and the contiguous peritoneal coat was stitched with a close series of Lembert sutures of catgut. The same method was followed in closing the open end of the descending colon. Finally, the sigmoid and transverse portions were brought in apposition and a wide lateral anastomosis was established between them. The free oozing of blood from the lacerated pancreas, the substance of which was too friable to hold a ligature, necessitated gauze-packing and the employment of a drainage-tube. These were removed on the second day and recovery was uninterrupted till ten days afterwards, when some fæcal discharge escaped from the track of the tube. This discharge became gradually more abundant, though happily without affecting the generally favourable conditions. The discharge soon

diminished and when the patient was able to leave the hospital, at the end of August, it had quite ceased and the wound was healed. The patient has been seen lately and continues in all respects well.

The foregoing cases are grouped together as examples of the method of re-establishing continuity of the bowels by lateral anastomosis. Case 1 exhibits the only instance in which any kind of clamp or support was made use of in effecting the junction, and in this case the cohesion effected by the pressure of the plates was not considered sufficient without the additional safeguards of a row of Lembert stitches and a wrap of omentum. When these additional measures are taken the saving of time effected by any form of button or clamp is seriously reduced. As a set off to the saving of time all such mechanical devices have the drawback that they restrict within very moderate limits the communication established between the two segments of intestine. It seems to be a matter of great importance, not only for the immediate relief of the symptoms but still more for the continuance of this relief, that the communicating opening should be exceedingly free; and this can only be secured when the junction is made by sutures alone. The plan followed in the other four cases was the same. The two portions of bowel to be united were placed side by side and where the sides lay in apposition they were joined by a series of Lembert sutures for a length of rather more than 3 in. Then an incision was made into each segment of bowel in that part of the wall opposite the mesenteric attachment and just falling short of the ends of the row of stitches. By an overcast suture through all layers the two openings were next united. This suture began in the margins which were contiguous and as it passed round it was carried through the margin of one opening and then through the corresponding point of the margin of the other, so that when the suture was tightened these were drawn together. In this way one end, then the corresponding outer margins of the two incisions, then the other end back to the point whence the suture started were united, and the openings in the two portions of bowel were converted into one large aperture of communication. To avoid puckering and narrowing of the opening the suture was tied off after each three or four stitches. Lastly, the cincture of Lembert stitches which was begun before opening the intestines was completed. Carried out in this way the suturing can be rapidly done, and as the anastomosis can be made as free as desired there need be no risk of future contraction.

Newcastle-on-Tyne.

LANDRY'S PARALYSIS.

BY ARTHUR S. TAYLOR, M.D. CANTAB., F.R.C.S. ENG.

CASES of acute motor paralysis rapidly proving fatal are so rare, especially in this country, that the following remarkable case is of the greatest interest. I have classed it as a case of Landry's paralysis as it appears to me that the symptoms followed more closely the lines of that disease than those of any other lesion of the nervous system with which we are acquainted. The paralysis, however, was not "ascending" as in the majority of cases, and the course of the disease was even more acute than in any I have seen described.

The patient was a man, aged forty-two years, who had been married twelve months. He had always enjoyed exceptionally good health and his life would have been accepted as a first-class one by any life assurance company. About six years ago he had a bad accident, being run over by an omnibus, but from this he completely recovered with the exception that he had a partially stiff left elbow-joint. He had been a good deal worried recently by domestic illness, but the cause had been removed and apparently he was not affected by it in any way. On August 7th, 1898, he went to bed in his usual perfect health. At seven o'clock the next morning he awoke to find his right arm tingling and numb. The left arm was affected similarly but to a less degree. He thought he had been "sleeping on his arm." When given a cup of tea he dropped it and on getting out of bed found that he had not the full power in his legs. There was a good strong grip with either hand. He could walk round the bed but was evidently afraid of falling. His pupils were equal and reacted to light but not perfectly during accommodation. Although he could see and recognise those about him he could only read with great difficulty. The knee-jerk was absent. His mind was perfectly clear and he was able to dictate a good business letter. There was no headache or other pain. Tactile sensation was perfect everywhere. The temperature was normal and the pulse was full and strong but not accelerated. On the afternoon of the same day I found the general loss of power slightly increased, formication of the arms and legs persisted, and the temperature was still normal. He passed a good night, but when I saw him early on the morning of the 9th (the second day of illness) all the symptoms were much intensified. He had now to be assisted to move in the bed. His tongue was slightly furred and the temperature had risen to 100° F. His sight was worse and the pupils no longer reacted to light. There was now also a distinct difficulty in articulation. The brain remained perfectly clear. In the afternoon Dr. James Taylor kindly saw the case with me. By this time it was apparent that the motor paralysis would soon become absolute. The breathing was shallow and bulbar symptoms were much more marked. There was no nystagmus or tremor. The third nerve was involved, as shown by ptosis and by paralysis of accommodation and of all the ocular muscles. The optic discs were normal. There was also paralysis of the soft palate with difficulty in swallowing. The temperature was still 100°. Dr. James Taylor drew attention to the similarity of the condition to that caused by curari poisoning and agreed that the condition was almost hopeless. On the 10th (the third day of illness) the motor paralysis became absolute with the exception that the patient could still move the head slightly from side to side. Any attempt to swallow set up spasms in the facial muscles; the respiration gradually failed and he died at 4.30 P.M. There were no bedsores. The nurse told me that the heart continued to beat long after respiration had ceased, but she did not notice whether abdominal or thoracic respiratory movements ceased first. The rectum and bladder were unaffected throughout and the urine was free from albumin and sugar.

The case was, no doubt, one of acute motor paralysis and it is probable that the whole of the grey matter of the spinal cord was affected. The bulb and the course of the third nerve were also involved. The slight rise of temperature which occurred in this case is, I believe, not usually observed, but the absence of anæsthesia, bedsores, and paralysis of the rectum and bladder sufficiently differentiates the disease from myelitis. The extremely rapid course of the disease and the absence of any symptoms of gross change in the grey matter point to some virulent poisoning of the latter structure and the analogy to curari poisoning lends colour to the theory of some toxic agency. There was little time to adopt any treatment. At the outset iodide of potassium was given, and on the second day $\frac{1}{120}$ grain of strychnine was injected hypodermically every three hours. Possibly this may explain the strong and persistent action of the heart. The patient was fed by nutrient enemata.

Surbiton Hill.

AN EMBRYOLOGICAL CURIOSITY.

BY J. ROSS MACMAHON, M.B., C.M. ABERD.

THE case described in the following paper embodies a number of points of great embryological interest. An alternative heading might have been, "Absence of Abdominal Wall, Bladder, and Anus, with a Semi-cloacal Condition and Bilateral External Genitalia, &c."

The child, an eight-month one, was the sixth offspring of the mother and was not born alive. Throughout her pregnancy the mother exhibited relatively little abdominal protrusion and she averred that she was ignorant of her condition until about one month before her delivery. By abdominal examination the child's parts could easily be felt. Examination *per vaginam* revealed the fact that the sacral region was the presenting part; in other respects matters were consistent with a normal condition. The labour only lasted three or four hours, very little liquor amnii escaped, and the ovum was delivered *in toto*. This circumstance was owing to the fact that the umbilical cord was represented by

a condition which obtains about the beginning of the second month of pregnancy. At this period the embryonic somatopleure (the part about to be folded in to form the body wall) is continued on beyond the embryo as the amnion (the extra-embryonic somatopleure) to the already determined placental area of the chorion. This continuation is quite short and the cord-like form between the embryo and the containing membrane is only assumed in later months. It will therefore be evident that consequent on the absence of the long umbilical cord and the presence of its short *anlage* the child and the placenta must of necessity be born together. It may be as well to state here that the child presented a lateral curvature to the right extending from the upper dorsal region of the spine to its lower limit; in addition to this the right lower extremity was doubled so that the sole of the foot apposed the corresponding buttock and the foot was a typical clubfoot. The left lower extremity was placed so that the foot apposed the forehead and was a talipes valgus. The abdominal wall was deficient in a kite-shaped area the tail of which was situated at a point corresponding to the ensiform cartilage, and the sides of which gradually diverged to the widest point rather on the outside of the middle of either Poupart's ligament, from which the dome-shaped head, passing beneath a point corresponding to the absent pubic arch, completed the area. The boundary of this space represented the point where skin formation ceased; beyond this the somatopleure, or body wall, passed on as in an early stage to become amnion. Through this gap the abdominal viscera protruded, the right kidney being rendered particularly prominent by a well-marked hydronephrosis as large as a duck's egg. The bladder was deficient, the left kidney occupying the site. It was indicated, however, by a very curious state of things, which is all the more interesting when compared with extroversion of the bladder of congenital origin and the condition of the genitals usually concomitant with that event. Bordering the middle line on

A, Talipes valgus. B, Umbilical vessels. C, Scrotum. D, Penis. E, Anal dimple. F, Ureter of left kidney. G, Penis. H, Scrotum. I, Pes varus. J, Right kidney. K, Hydronephrosis. L, End of gut with quill passed through.

either side an ill-defined leaf-shaped space was visible on the lower end of the body wall, and here, in contrast to the surrounding somatopleure, two layers could be felt and rolled over each other. The two areas were quite independent and their walls could be separated and dissected up to the middle line, where they fused. This condition is really suggestive of a precursory duplex bladder and would seem to imply a bifid allantois. Into each area a ureter could be traced, so far as could be made out, ending blindly on the right side (that of the hydronephrosis), but having a minute opening on the left side. The lower margin of the spaces formed most of the dome of the kite-shaped deficiency of the abdominal wall; below this skin formation commenced and passed along to the perineum. Situated at this point on either side and about an inch apart was a well-formed though diminutive penis. Each penis presented a glans, a prepuce and a closed meatus urinarius, and below them the skin was sacculate and thrown into loose folds so as to form a scrotum. The testes had not descended and were lying high up, where they were formed from the genital ridge. The duplex quasi-bladder corresponded well with the formation of two penes, but there was no communication between the penes and the bladders. On the under or dorsal side of each penis a distinct but comparatively faint raphé was observable, indicating the presence of two uro-genital sinuses at an earlier period.

Before passing to perhaps the most interesting abnormality which was manifested in this case it may be opportune to observe that in normal pregnancies the cloaca in the human embryo exists up to the fourteenth week. Into it open the two Wolffian ducts, the two fused Müllerian ducts, the allantois, and the intestine. A vertical division of the cloaca from side to side, growing up from below in the form of an epithelial plate, divides it into an anterior or uro-genital opening and a posterior or anal opening. This involves the complete separation of the uro-genital system from the intestinal canal. The Wolffian ducts form the kidneys and ureters in both sexes, and the spermiduct, seminal vesicles, &c., in the male, and the connexion with the gut then vanishes. The Müllerian ducts fuse before entering the cloaca per the neck of the allantois. In the female they form the uterus, the vagina, the Fallopian tubes, &c.; but in the male a remnant is retained in the uterus masculinus. In the present case the anus was represented by a slight dimpling at the normal site, but no perforation had occurred and the gut ended in the middle line between the two bladder areas. The termination was abrupt and was situated just in front of the skin of the perineum and it was quite patent. About 1 in. above the end of the gut, and communicating with it posteriorly, lay numerous coils of tube of varying circumference. These occupied a site behind the gut, and on a close inspection it could be seen that the mass really consisted of three distinct and blind tubes all conducting to the rectum. On slitting the rectum with scissors the three openings could be seen and a quill could be passed into each. The tubes were arranged one on each side of a larger and central one. The two lateral tubes were of equal lumen and length and were placed symmetrically. The central one was much longer and of much greater circumference and it gradually tapered off at its blind end. A semi-cloacal condition of things was thus revealed. The central blind duct was doubtless the fused Müllerian ducts (the uterus, Fallopian tube, &c., in the female) which had remained instead of undergoing resorption and disappearing. The two lateral tubes were the remnants of the two Wolffian ducts which had also failed to disappear. Some distance up the large intestine was a narrow strip of cicatricial-like tissue 2 in. long; it was flat and smooth and felt like a piece of parchment let into the long axis of the gut. This doubtless was the site of the closure of the yelk sac. Around this the bowel was gathered up in pleats and puckers which radiated outwards. Strangely enough, there was absolutely no sign of an appendix vermiformis, but some inches above the closure of the yelk sac, and corresponding exactly to the site at which the appendix should come off, was an exact facsimile, in miniature, of the condition described at the closure of the yelk sac. The parchment-like longitudinal plateau, the puckering of the gut, &c., were all represented.

In reviewing the case I would suggest that the cause of the limb and spinal deformity was the dearth of liquor amnii. Pressure would be a consequence of this deficiency, and the position and deformities of the child were consistent with this theory. The idea might be carried further, and it would be reasonable to suppose that the scantiness of the liquor amnii, combined with the resulting position of the legs of the fœtus, exerted a combative influence against the normal evolution of the other parts.

Kensington, W.

TRAUMATIC SEPARATION OF THE LOWER EPIPHYSIS OF THE HUMERUS WITH DISPLACEMENT FORWARDS.

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THE rarity of displacement *forwards* after separation of the lower epiphysis of the humerus induces me to put on record the following case.

A boy, aged ten years, living in the country fell, as I understand, from a see-saw, or swing, alighting on his right hand. Shortly afterwards the elbow was painful, but as there was no idea of any serious injury having occurred medical advice was not sought until some time had elapsed and no splint was applied. At the end of three weeks, as the elbow remained stiff and slightly swollen, the patient was brought up to town. The right forearm was in a position of flexion, forming an angle of 145° with the arm, and the boy was unable to extend it voluntarily any further. Full flexion, however, could be satisfactorily accomplished and practically without discomfort. The biceps cubiti was kept contracted. The forearm, moreover, was somewhat pronated and it was impossible for the patient by his own effort to completely supinate without pain. Examination under ether showed flexion to be free, but extension impeded though it could be forcibly accomplished. Creaking about the joint was noticed, but all the usual movements were nearly normal in their range. When I saw him first in consultation with Dr. John Shaw-Mackenzie between four and five weeks after the original injury, it was observable that there was no evidence of inflammation about the joint. A distinct dimple could be seen about the tip of the olecranon process, which was not apparent on the sound side. The three bony prominences bore their normal relationship to one another, but appeared to be on a plane anterior to the shaft of the humerus when compared with the left side. Measurement of the arm gave a like length on the two sides, but the distance from the projecting part of the humerus on the outer side to the radial styloid process showed some increase in the length of the forearm. Forcible movement without an anæsthetic proved that full extension of the elbow joint was impossible, though flexion could be readily brought about. The other points were much the same as those alluded to above. Seeing the unusual nature and uncertainty of the lesion my friend, Dr. F. H. Low, very kindly and successfully skiagraphed both the normal and abnormal elbow-joints. Each limb was placed with its inner surface upon the sensitive plate, with the elbow flexed at a right angle. The prints from the negatives showed very clearly the dimple mentioned before in the curve of the line of the soft parts. It showed, further, that the breadth of the limb at the region of the elbow was distinctly increased, and this without there being any local swelling or œdema. The ossific centres of the lower epiphysis were displaced distinctly forwards, well shown by their relationship to the shaft of the humerus.

I have been unable to find more than a few references to what I believe the case under review to be—namely, a traumatic separation of the lower epiphysis of the humerus with displacement forwards. Hamilton[1] does not mention it and Pick[2] makes no allusion to it, nor does R. W. Smith[3] in his paper on the subject. All these and other authorities give a full account of the much more common *backward* displacement. An excellent skiagram of this latter deformity is given by Roswell Park.[4] J. Hutchinson, jun., says[5]: "Very occasionally the epiphysis is driven forwards instead of backwards," and in one case under his care the forward displacement was well marked. I believe the prognosis as to the subsequent growth and usefulness of the limb is good in the majority of these cases, provided that passive movement, together with massage, is early resorted to. In this particular case the patient has now a useful limb, with but little deformity, although it has taken many months to bring this result about

Harley-street, W.

[1] A Treatise on Fractures and Dislocations, eighth edition.
[2] Fractures and Dislocations, 1890, p. 191.
[3] Dublin Quarterly Journal, vol. ix., 1850, p. 63, and Brit. Med. Jour., vol. ii., 1867, p. 121.
[4] A Treatise on Surgery, vol. i., 1897, p. 718, plate xxi.
[5] Brit. Med. Jour., vol. ii., 1893, p. 1418.

CHLORODYNE POISONING

BY JAMES GILROY, M.B., C.M. GLASG.

ON Jan. 15th, 1895, at 12.30 A.M., I was called to see a man, aged seventy years. Having to travel two miles I did not see him till 1 A.M. I found him unconscious with stertorous breathing and the pupils unequal, the left being contracted to a pin's point and the right moderately dilated. The surface of the body was fairly warm, there was a considerable amount of perspiration over the trunk, and the pulse was full and regular, being about 70 per minute. The history I got was that about 8.30 P.M. on the 14th he had retired to bed as was his wont and that later, about 11 P.M., some of his family fancied they heard unusually heavy breathing and entered his room, having to force the door, and found the patient on the floor; lying in close proximity was a bottle of cough mixture, an eight-ounce bottle, which was three-quarters empty, leaving scarcely two ounces in the bottle. The mixture smelt strongly of chlorodyne and was a patent medicine labelled "Joe Todd and Co.," with a graduated dose scale given on the label up to one tablespoonful and "not intended for infants" printed thereon, together with an intimation on the reverse side that "owing to containing morphine and other valuable drugs" the requirements of the law required it to be labelled "poison." I was told that before I had arrived the patient had vomited slightly, his son having administered mustard and water and put him to bed. Not having had any intimation of the nature of the case I had nothing with me, but despatched a messenger for the stomach tube and some emetics and meanwhile I proceeded to try to rouse the patient, which was apparently indicated. This was done by pinching him, signs of pain being evinced, and by getting him out of bed and walking him about as best we could for upwards of an hour. He exhibited signs of knowing what was being done, but his condition was, to say the least, alarming. On arrival of the tube I washed out the stomach freely with hot water and followed by introducing some infusion of green tea and later some Liebig's extract in hot water. About 5 A.M. I left him, after having expended some considerable effort, and finding that on speaking loudly to him he evinced signs of consciousness. I called again at 4 P.M. I found him still sleeping soundly, the pupils being in the same condition as before; there was no change. I introduced into the stomach two-thirds of a quart of warmed milk with a little lime-water, and left him, to return again at midnight to find the same state of affairs, when I again introduced about one pint of milk with the stomach tube. I continued to attend the patient twice daily all the week and the treatment was as stated all through until the afternoon of the 18th, when he awoke and sat up to assist me with the tube, which he appeared quite to understand was being used for his benefit, but he did not speak, though when he was spoken to his lips moved as if he were attempting to answer. On the 16th I noticed the odour of opium very perceptibly in his breath, but on no other day could I detect it except more faintly on the 17th. On the 19th, on my visiting him in the afternoon, he spoke to me quite plainly, asking if he had been asleep over twenty minutes. All through there was no involuntary discharge of urine. It was passed naturally and was loaded with urates, and only on one day—viz., the 17th—was it retained over twenty-four hours.

The patient told me that the dilated eye had been one for which he had had special advice and treatment, but whether that had anything to do with the inequality of the pupils is another question; but I noted that the condition was still present on the 23rd—that is to say, although the firm contraction had yielded in one eye the other pupil was larger. He was then taking his food well and was very hungry. On the 19th the history I got was that his demands for food were incessant, whilst on the 23rd he had practically recovered. The mixture came into his possession on the evening of the 12th and he simply drank it *ad libitum* at intervals, and admitted taking a drink of it from the bottle,

using no measure, on his entering his room on the evening of the 14th, but he remembered nothing else.

Waterbeck, Dumfriesshire.

RUPTURE OF THE LEFT CORONARY ARTERY; HÆMOPERICARDIUM; FAILURE OF PULSE IN THE RIGHT CAROTID AND RADIAL ARTERIES.

BY LAURENCE HUMPHRY, M.D. CANTAB.,
ASSISTANT PHYSICIAN, ADDENBROOKE'S HOSPITAL, CAMBRIDGE.

THE following case is worthy of record, partly on account of its clinical interest and partly because it reveals a somewhat rare pathological condition.

The patient was a woman, aged fifty-eight years, and unmarried. She had always enjoyed good health except that about thirty years ago she had suffered temporarily from albuminuria. Up to the time of her death she was active and free from breathlessness and pain and a few months previously she had taken long walks on the mountains without undue fatigue. On Nov. 15th, 1896, while she was at breakfast she complained of a sense of faintness and dizziness and soon afterwards she was violently sick. When she was seen at 9.30 A.M. she was lying on the floor looking pale and anxious. She complained of pain in the stomach and a feeling of numbness on the right side. The right radial pulse was imperceptible, the left was 100 and was feeble and irregular in force. The præcordial dulness was not increased and the apex beat was not felt; the heart-sounds were feeble at the apex, and a roughness was noticed with both sounds at the base. The extremities were cold and clammy. Hot bottles and stimulants were ordered and a mustard plaster was placed over the præcordia. Two hours later she was very restless and was unable to express herself coherently. Her face was pale and cyanosed and the right jugular vein appeared full and prominent. The bowels had acted copiously and the sickness was decreasing; she could move all her limbs and only complained of pain at the pit of the stomach. During the afternoon she was evidently getting weaker and less conscious. The right pulse was still absent but on further examination the radial vessel on that side could be distinguished and rolled under the finger, though it was not distinctly hard. The right brachial artery could also be felt but pulseless, and no beat could be distinguished in the right carotid artery. The left pulse was quite distinct, but feeble, irregular, and intermitting slightly with inspiration. At this time it was noticed that on turning the patient over on to the left side to give a nutrient injection the right pulse could be distinctly felt and continued as long as she remained in that position, but disappeared again immediately on turning on to her back. A rapid auscultation of the back on the right side indicated some tubular breathing at the angle of the right scapula but owing to the patient's condition no further examination could be made. In the evening there were several loose actions of the bowels containing small quantities of red blood. The patient never rallied, but became weaker and died at 2 A.M on Nov. 16th, 17 hours after the first onset of the attack.

Necropsy.—At the post-mortem examination the large veins of the neck were found distended and prominent. The pericardium bulged slightly but was covered by the left lung to the normal extent. The pericardial cavity contained about from 5 oz. to 6 oz. of blood and clot. The heart appeared of normal size and weight but the walls were soft and flabby. There was no evidence of any valvular disease. On the surface of the heart near the aorta was a small opening of the size of the head of a large pin and here there was much extravasation of blood into the muscular tissue and fat and upwards into the fold of pericardium ensheathing the first part of the aorta. The result of this was the production of a swelling which reached so high as to cause pressure on the innominate artery. There were a few patches of atheroma in the aorta and both coronary arteries were throughout the seat of extensive atheromatous disease. They were both dilated and the left coronary artery was ruptured about a quarter of an inch from its exit from the aorta, the rupture corresponding in situation to the small orifice above described. There was no sign of a small aneurysm of the coronary vessel and the sinuses of Valsalva were normal. The muscular substance of the heart was in an advanced state of fatty degeneration.

Remarks.—Rupture of a coronary artery appears to be a rare incident and there are but few recorded cases. In THE LANCET of June 4th, 1887, Dr. J. W. Batterham records a case in which there was a rupture of the coronary artery near the apex of the heart causing hæmopericardium, and in *The Medical Times and Gazette* of March, 1862, Mr. Osborne describes a case in which the coronary artery was ruptured near its origin from the aorta. The coronary artery is sometimes the seat of a small aneurysm which may rupture, and in the Transactions of the Pathological Society of London for 1871 Dr. Crisp has collected 11 cases, all occurring in males, and in 7 of which rupture took place into the pericardium. The failure of the right pulse beat in this case is very interesting and in the absence of any other explanation must, I think, be attributed to the pressure of the extravasated blood upon the innominate artery. The swelling produced in this situation was very obvious after death and was probably greater during life as the blood continued to escape into it. While the patient was lying on her back with the head low the pressure was sufficient to obstruct the pulse in the innominate artery, but when she was turned on to the left side the blood in the pericardium flowed towards the apex and relieved the pressure sufficiently for the pulse to return. The tubular breathing heard at the right base behind may have been due to the pericardial effusion, but whether this sign was present on the left side also I am unable to say. Other noteworthy features in the case are the absence of angina and the fact that the patient had been able to take very active exercise in spite of the advanced fatty degeneration of the heart muscle and the extensive atheroma of the coronary vessels.

Cambridge.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF BELLADONNA POISONING.

BY R. A. MORRIS, M.B., B.S. DURH.,
LATE RESIDENT ASSISTANT HOUSE SURGEON, ROYAL INFIRMARY, NEWCASTLE-ON-TYNE.

ON Feb. 24th, 1897, I was called to see a man, aged forty years, a patient of mine, who was suffering from pleurisy with effusion on the right side and phlebitis of the right femoral. For the latter he was using a paint composed of extract of belladonna ½ oz. with glycerine to 1 oz. At 7.15 A.M. his daughter, aged twelve years, went to give him a dose of medicine and in mistake gave him a tablespoonful of the preparation just mentioned, so that he got 2 drachms of extract of belladonna. When I saw him at 10.30 A.M. he was comatose, his breathing was very shallow, his pulse was almost imperceptible, his skin was dry and the pupils were widely dilated. I immediately gave him a hypodermic injection of ¼ gr. of pilocarpine hydrochlorate and washed out his stomach. I may state that before I saw him his wife had administered some mustard and water, which caused him to vomit about a wineglassful of fluid, but there was little or none of the belladonna in the vomit which was kept for my inspection. The fluid which came away when I introduced the stomach tube contained a considerable amount of the poison. Subsequently to washing out the stomach I introduced a quart of strong coffee, a little of which he vomited. I gave him another hypodermic injection of ¼ gr. of pilocarpine hydrochlorate. His breathing by this time was much deeper and his pulse was much stronger, 120 to the minute, and he now tried to push away those near him. His wife said that

previously to his becoming unconscious he complained of soreness and dryness of the throat; he occasionally smiled and muttered, but never laughed outright or talked loudly. I left him at 12.15 P.M. He was muttering a little but both pulse and respiration were strong.

On seeing him again at 2.30 P.M. his temperature was 102·7° F., but it must be remembered that his temperature was previously 100° from the pleurisy and phlebitis. He was now conscious of what was said to him, putting out his tongue when I asked him to do so. He would not attempt to swallow anything. The pupils were still very widely dilated and did not react to light. I again administered ¼ gr. of pilocarpine, thus making in all ½ gr. There was no scarlatiniform rash to be seen and no paralysis of the sphincters. He frequently retched, but he never vomited subsequently to the vomiting which followed the dose of mustard and water. On seeing him again at 7.30 P.M. his pupils were still much dilated and did not react to light. On attempting to take a little coffee he felt very sick but did not vomit. His temperature was now 102·2°. He recognised me but did not remember what had taken place beforehand. On Feb. 25th his temperature was 100°, his pulse was 108, and he was sweating profusely, as he had done all night. He had had some disturbed sleep. He fancied he saw black things moving about during the night, and also fancied that the pictures in the room were all kinds of strange animals, although he knew they were the pictures. On closing his eyes tightly there was an awful blackness with white stars here and there. The pupils were still dilated but reacted slightly. On examining his chest I found that it was markedly improved, the effusion having nearly all gone. He described himself as being sore all over but with no definite pain. On Feb. 27th the pupils were normal, the temperature was 99·4°, and the pulse was 92.

Bedlington, Northumberland.

PIN IN THE RECTUM FOR THIRTY YEARS.

BY W. DUTTON AKERS, M.R.C.S. ENG., L.R.C.P. LOND.

A MAN, aged fifty-eight years, a linendraper, consulted me with a view to obtaining relief from the following symptoms. He had pain in the rectal region of a pricking character on sitting down, constant desire to defecate, great pain on doing so, and the motions were small, pipe-like and streaked with blood. These symptoms had been present with more or less intensity for a period of thirty years; he had frequently sought medical aid, and the treatment generally took the form of morphia suppositories or other local applications. Examination revealed the presence of external hæmorrhoids, and digitally considerable induration and inflammation of the mucous membrane covering the internal sphincter was detected. Above and at the right side of the internal sphincter the head and about half an inch of the body of a pin were to be felt, the head projecting upwards and somewhat across the lumen of the intestine. With the aid of a pair of long dressing forceps introduced by the side of the examining finger the pin was pushed up into the rectum, rotated, and then extracted head foremost. Thanks to the pluck exhibited by the patient I was enabled to carry out this painful manipulation without an anæsthetic. The removal of the *fons et origo mali* was followed by a rapid subsidence of the symptoms which had prevailed for so many years. This case illustrates the great importance of making a careful examination of the rectum in such cases. I suspected carcinoma and found an easily removeable pin. The patient was unable to account for the pin, but his occupation is a sufficient explanation.

Bath.

STRANGULATED HERNIA IN AN INFANT.

BY J. E. BRISCOE, M.R.C.S. ENG., L.R.C.P. LOND.

THE patient, a small, healthy child, twenty-one days old, who had been quite well up to the evening of the day before my visit (Sept. 8th, 1896), became cross from no obvious cause and a dose of castor-oil was given. Later in the evening a small motion was passed, but the child continued to be extremely fretful and was at 9 A.M. next day evidently ill, the face appearing pinched. Vomiting had occurred once and no motion or flatus had passed since the day before. The scrotum was slightly œdematous and red on the right side and distended by a very tense pear-shared swelling. The swelling seemed to end completely at the external inguinal ring and no alteration was discovered in it when the child cried. The physical signs were those of inflamed hydrocele, but the symptoms pointed to hernia, and a hot bath having been given an attempt at reduction was made, but with no success. Under chloroform—administered by Dr. David Watson—an incision was made into the sac. From one to two drachms of dark serous fluid escaped and a coil of bowel, thickened and distended, dark-purple in colour but still glossy, was exposed. The length of the coil was from 3 in. to 4 in. The walls of the sac, the epididymis, and the cord behind were very deeply congested. With the child inverted a second attempt at reduction was made. This failing the canal was dissected up and the internal ring was laid bare. Throughout the whole length of the canal the bowel was tightly invested by the thickened peritoneal tube and at the internal ring the constriction was very marked. The point of a Lister's sinus forceps was, however, passed through the ring and was then brought out above the upper margin, and the portion thus separated was divided on the forceps as on a director. A further quantity of dark fluid escaped from the abdominal cavity when this was done. The bowel was then easily reduced on inverting the child. The ring was closed by two catgut sutures and the edges of the incision were brought together loosely by two sutures of silkworm gut. Healing was rapid and uninterrupted. The bowels acted regularly from the first night.

I think the following are points of interest in the case: (1) the youth of the child; (2) the apparent abrupt termination of the sac at the ring, leading to a very close resemblance to hydrocele; and (3), the tight tube of peritoneum which surrounded the bowel. Nothing larger than the point of a probe could pass along this and I was in consequence obliged to make an open dissection of the canal. How the bowel entered this tube is a mystery.

The child still wears a woollen truss of the kind described in Pye's "Surgical Handicraft" which has been worn since a fortnight after the operation, and in this case as in other cases of congenital hernia it answers admirably as a support to the ring.

Leeds.

A Mirror OF HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

ROYAL FREE HOSPITAL.

A CASE OF COMPOUND FRACTURE OF THE PATELLA DUE TO A KICK FROM A HORSE; RECOVERY WITH A MOVEABLE JOINT.

(Under the care of Mr. W. H. BATTLE.)

THE value of modern surgery is in few conditions more strikingly shown than in wounds of joints. In pre-antiseptic days an extensive wound of any large joint was certain to be followed by prolonged suppuration, in only too many cases terminating in septicæmia or pyæmia; and so fully were these dangers recognised that a primary amputation was often advocated. The importance of a wound of a knee-joint was greatly aggravated by fracture of the patella, for even if the patient were fortunate enough to survive the lengthy suppuration and its concomitant septic dangers he was left with a limb which was absolutely useless for walking. The contrast between these severe symptoms and results and the effects of modern treatment are strikingly shown in the following account of a compound fracture of the patella. Recovery was rapid and practically uneventful, for the slight rise of the temperature which occurred on one occasion immediately disappeared after the administration of an enema.

A cabman, aged fifty-three years, was admitted into the Royal Free Hospital on April 20th, 1898, for injuries to his

knees. Shortly before his admission to the hospital he was, whilst sitting on the driving seat of his cab, kicked on both knees by the horse, a vicious animal, the splash-board being destroyed. On the left knee there was only a small and comparatively unimportant wound extending down to the patella, but on the right knee there was a transverse lacerated wound extending almost the whole width of the limb. Through this opening the interior of the knee-joint could be seen, and it was at once evident that the right patella had been broken transversely into two large pieces, though several smaller fragments could be felt. The two large pieces formed about five-sixths of the patella. The wounds were temporarily dressed with an antiseptic application and a back splint was applied to the right leg. On the evening of the day of admission, about five hours after the accident happened, the patient was anæsthetised and Mr. Battle, who had been sent for, proceeded to wire the bone. An incision three inches long was made directly upwards from the middle of the horizontal wound on the right knee, the flaps were reflected on each side of this incision, and the knee-joint was completely exposed. The joint cavity, the bony fragments, and the surrounding parts were then thoroughly washed in a solution of perchloride of mercury (1 in 2000). Two or three small fragments required removal. Then the two larger pieces of bone were joined together with silver wire and the ends of the wire, after having been twisted, were hammered on to one of the fragments. The aponeurosis over the patella was united by silk sutures and the edges of the skin wound, having been carefully pared, were drawn together with interrupted sutures. A drainage-tube was inserted through a separate incision in the outer side of the joint. A dressing of double cyanide gauze and absorbent wool was applied and the limb was enclosed in a plaster-of-Paris splint. The wound on the left knee was sutured and dressed in a similar manner. On April 22nd the right knee was dressed and the drainage-tube was removed. On the 24th the temperature rose to 100° F. but fell to normal on the bowels being opened by an enema. On May 3rd the skin stitches were removed and the plaster-of-Paris splint was exchanged for a wooden back splint. On the 12th the patient was allowed to sit up and on the 19th the splint was removed, a small dressing only being applied. On the 24th he was discharged from the hospital; he had firm union of the patella and was able to walk. Further improvement has resulted.

Remarks by Mr. BATTLE.—The patient was not regarded as a favourable subject for operation, his occupation and appearance suggesting that he was not a teetotaler. He was a stout, heavy man, with dilated cheek capillaries. Subsequent examination, however, did not show any visceral disease, although his arteries were hard and tortuous. In a simple fracture of the patella there are many conditions to be taken into account by the surgeon before he can decide whether it is best to wire the patella or not, whereas in a case of compound fracture he has no option; the fragments if they are of sufficient size must be wired if the joint is to be rendered useful in the future. In addition it is imperative that the wound should be rendered thoroughly aseptic and here the treatment which the case first receives is of the greatest importance. If when the patient is first seen the applications to the wound are thoroughly applied a successful result may be hoped for, but if not a suppuration in the joint at the least is to be feared. When wiring is performed for simple fracture the surgeon can prepare the patient and make the outside of the joint aseptic, he can also choose his own time for the operation; these conditions do not apply in compound fracture. Some months ago I showed at the Medical Society of London a case of compound fracture of the patella in a young man caused by a fall of several feet from a ladder with his bent knee striking on the edge of a barrel. He was under my care at St. Thomas's Hospital and a result in every way satisfactory was secured without suppuration after wiring. In both instances much credit is due to the house surgeons for their earlier treatment and prompt recognition of the injury, as well as for their great care in the after treatment.

ROYAL INFIRMARY, NEWCASTLE-ON-TYNE.

THREE CASES OF FÆCAL FISTULA TREATED BY OPERATION.

(Under the care of Mr. RUTHERFORD MORISON.)

ALL the three cases recorded below are of interest. In the first a correct diagnosis was made and the extent of the tuberculous disease of the bowel necessitated a wide operation, fully justified by the complete removal of all the diseased intestine; it was not found necessary or even desirable to employ any mechanical contrivance for effecting the intestinal anastomosis. In the second case a sub-peritoneal abscess had burrowed widely in the anterior abdominal wall and had perforated the transverse colon as well as the skin. Although the suppuration had commenced in the right side it was quite unconnected with the vermiform appendix, which was healthy. The third case illustrates a sequela of lateral lithotomy which is much less frequently met with now than formerly, chiefly because the operation itself is not so often performed. For the notes of the cases we are indebted to Dr. Grant Arnott, house surgeon.

CASE 1.—A girl, sixteen years of age, was admitted to the Royal Infirmary, Newcastle-on-Tyne, on Dec. 1st, 1897. The patient was very small and ill-developed and had always been delicate. Fourteen months previously to her admission a painful swelling appeared in the right side of her abdomen. A month later this lump burst and discharged pus and fæces. Three openings formed which had discharged ever since. At first most of the fæces passed through these openings and very little *per anum*, but for some months the greater part of the motions had been passed naturally. On admission to the infirmary her general condition was very bad and she suffered from constant discomfort. In consequence of the leakage of fluid fæces she had a painful dermatitis of the skin at the lower part of her abdomen. In the right iliac region, surrounded by cicatricial tissue, were three fistulous openings discharging pus and fæces. Underneath the fistulæ there was a hard mass of the size of half an orange, apparently in the head of the cæcum. The constant discharge of fluid fæces led to a diagnosis of fistula in the small intestine. The hard mass and the general appearance of the patient, with the history suggested tuberculous infiltration and ulceration of the cæcum. The diagnosis of tuberculous ulceration of the cæcum, ileum, and ileo-cæcal valve was made. The condition of the patient was intolerable to herself and others and careful treatment by competent surgeons had failed to relieve her. Operative treatment was therefore imperative. Accordingly, on Dec. 9th an elliptical incision was made round the fistulæ and the infiltrated skin. The two ends of the ellipse were then prolonged anteriorly to the middle line and posteriorly to the back of the ilio-costal space. The abdominal cavity was opened in this line and carefully packed off with sterile gauze. The cæcum was firmly adherent to the abdominal wall and also a loop of ileum 1 ft. from the ileo-cæcal valve. Both portions of intestine were thick, firm, and infiltrated with tubercle. The ileum was clamped between two pairs of forceps and divided on the proximal side of the fistula, and the diseased portion, together with about 18 in. of healthy bowel between it and the diseased cæcum, was separated from its mesenteric attachment up to the cæcum. The ascending colon was then divided between two pairs of forceps beyond the diseased cæcum, which was cut away still attached to the ileum. Along with the cæcum a large tuberculous gland was taken out of the meso-cæcum. This part of the operation was difficult because of extensive and firm adhesions. The forceps holding the cut end of the ileum and the colon were next drawn forward and a continuous catgut suture which was run through all the coats closed the cut ends of the intestine before the forceps were removed. When this had been done the portion of the intestine gripped by the forceps was doubled in and retained by a few interrupted Lembert's sutures. A lateral anastomosis was then made between the ileum and the transverse colon by an inner continuous suture of catgut through all the coats and by an interrupted ring of silk Lembert's sutures. The wound in the abdominal wall was closed by strong silk sutures through the different layers. There was considerable tension on these sutures owing to a portion of the abdominal wall, which was infiltrated and adherent to the intestine, having been excised. The excised intestine showed a healed tuberculous ulcer of the ileum causing stricture and an infiltrated, contracted, and ulcerated cæcum. Both the ileum and the cæcum had fistulous openings in them. Immediately after the operation the patient was much collapsed, but she rallied after having been transfused with 40 oz. of normal saline solution. No fæces have escaped from the wound since the operation, her bowels have been moved without difficulty, her appetite has been good, and her general condition is satisfactory.

CASE 2.—A girl, aged nine years and six months, was admitted to the infirmary on Feb. 12th, 1898. She had had attacks of pain in the abdomen, accompanied by vomiting,

for six years. These attacks came on periodically and were attended by constipation. In the intervals she frequently had diarrhœa. About six months before admission an abscess formed at the umbilicus and burst. Fæces and pus were discharged from it and had continued to do so ever since. On admission a small opening was found at the umbilicus discharging pus which was neutral in reaction and had no fæcal odour. On pressing on the abdomen fæcal matter was seen to come through the opening. A hard tender mass of the size of a hen's egg was felt in the right iliac fossa; otherwise nothing abnormal was discovered. The patient was well nourished and the pulse and temperature were normal. On Feb. 17th an elliptical incision was made round the umbilicus, including the fistulous opening. The umbilicus and the outer opening of the fistula were excised. The incision was then prolonged downwards to the pubes in the middle line, but no entrance could be effected on account of adhesions. The incision was next extended upwards and the abdominal cavity was entered above the umbilicus. A sinus was then found to extend in the subperitoneal tissue from the neighbourhood of the umbilicus down to the right iliac fossa and into a coil of thickened ileum adherent there. This formed the mass discovered before the operation. The ileum was separated and the hole in it was closed by a continuous catgut suture through all the coats, and outside of this interrupted Lembert's sutures, transversely to the axis of the bowel. The sinus was then dissected out from the parietes. As this was being done the track was found to branch upwards and to extend to an opening in the hepatic flexure of the colon. The colon was dissected from the parietes and the opening in it was closed in the same manner as that in the ileum. To remove the sinus in the parietes it was necessary to extend a second incision from the middle line to the right iliac fossa. The appendix was found to be normal. The abdomen was completely closed with silk sutures. The patient never appeared to be ill after the operation and made a good recovery. The only drawbacks experienced were some superficial gaping and suppuration of the transverse portion of the abdominal wound, which granulated up. There was no fæcal discharge from the wound.

CASE 3.—A man, aged twenty-seven years, had a lateral lithotomy performed on him seventeen years before his admission to the infirmary, since when he had suffered from constant discomfort and annoyance owing to the passage of fæces and flatus by the urethra. He had enjoyed good health till three and a half years before admission, when he became ill and an abscess formed in the right loin and was opened. Since then his general condition had improved. He was in good health with the exception of the urinary organs. The urine, which on examination was found to be acid and of specific gravity 1017, smelt rather fæcal and contained pus, bacteria, and blood. The quantity passed for the twenty-four hours preceding the operation was 16 oz. On examination under an anæsthetic with a catheter in the bladder and a finger in the rectum a round hole of about the size of a split pea could be felt in the anterior wall of the rectum, slightly to the left of the middle line, about 1½ in. above the anus. A probe passed through the opening touched the catheter in the prostatic portion of the urethra. A scar was present in the perineum in the position of a lateral lithotomy wound. An operation was performed on Feb. 7th, 1898. The patient was placed in the lithotomy position and a semilunar incision was made through the skin of the perineum from one tuberosity of the ischium to the other. The skin flap was dissected downwards and a transverse incision was made across the perineum and the rectum was separated from the urethra, previously catheterised. The openings in the rectum and in the urethra were then both plainly seen. The hole in the urethra was closed vertically by fine catgut sutures over a No. 18 catheter, avoiding the mucous membrane. The opening into the rectum was treated in a similar manner. Buried sutures of catgut were then deeply introduced and tightened, making the transverse incision antero-posterior, much the same as is done in Mr. Lawson Tait's operation for ruptured perineum. The sinus in the lumbar region was explored and scraped. (So far as could be ascertained no urine had ever come through this.) The after progress of the case was good. No urine escaped from the wound after the operation and from the second day the amount of urine passed rose to the normal. The perineal wound healed by first intention. The patient was seen again in June of this year, when the sinus in the back was found to be reduced to very small dimensions. There was still a trace of pus in the urine.

Remarks by MR. MORISON.—Case 3 is interesting in connexion with the recent suggestions concerning transplantation of the ureter into the intestine. The patient had no trouble except for the disagreeable experience of passing fæces and flatus *per urethram* for thirteen and a half years. It was evident that most of the urine which passed into the bowel was absorbed. The quantity of urine passed before the operation compared with that passed after and the fact that his bowels were regular and the motions of normal consistence make this certain. Although no urine escaped through the sinus in the back it appears to be fairly clear that the abscess in the loin was connected with the kidney. This seems to be the great risk of such operations and the danger evidently cannot be considered to be removed for some time after an apparently successful operative result.

Reviews and Notices of Books.

On Cardiac Failure and its Treatment, with especial reference to the Use of Baths and Exercises. By ALEXANDER MORISON, M.D., F.R.C.P. Edin. London: The Rebman Publishing Company, Limited. 1897. Pp. 256.

THIS is essentially a "Nauheim" book in its latter portion, with the usual presentation of sphygmograms and areas of cardiac dulness in illustrative cases. But the author has attempted a good deal more than this, and the earlier portion of the work is a disquisition on cardiac failure from a general standpoint. It commences, somewhat unnecessarily, with the elementary anatomical facts about the position and relations of the heart and the methods of palpation, auscultation, and percussion, which, as the book is not for beginners, might judiciously have been omitted. They are, however, very well put and are mingled with a number of clinical observations of no small value. The writer follows the late Sir Richard Quain in his views on the causation of the first heart-sound, and his remarks on "cantering" action and quadruplication of the heart-sounds are worthy of attention. The sections on the extra-cardiac signs of cardiac failure and on the signs in the nervous system are also good. The pathology of cardiac failure receives somewhat inadequate consideration in the second division of the book. It is perhaps too much to expect that such work as that of Starling, set forth in his Arris and Gale Lectures (1897), should be incorporated in a book published in the same year, but that is the kind of solid substratum which is wanting in Dr. Morison's volume. The third division of the book is devoted to the general treatment of cardiac failure, and here we find a fair *résumé* of current doctrine on the subject, though there is nothing of any novelty. The latter half of the book is devoted to baths and gymnastics, chiefly to the Nauheim treatment. The author has, of course, visited Nauheim and is very fair and dispassionate and states facts as he has found them from his own observations. The treatment is, as is now well recognised, an excellent one in certain selected cases and Dr. Morison does not err in indiscriminately recommending it. The effect of mechanical exercises as devised by Zander, Oertel, and Schott is discussed at considerable length. There is an appendix by Medizinalrat Dr. Groedel of Bad Nauheim in which the ground is recapitulated. The book contains a good deal of useful clinical observation.

Manual of Chemical Analysis, Qualitative and Quantitative. By G. S. NEWTH, F.I.C., F.C.S. London: Longmans, Green and Co. 1898. Price 6*s.* 6*d.*

MR. NEWTH opens his preface with a very sensible diatribe against the somewhat prevalent idea that a specific analysis may be performed satisfactorily without learning more than a minimum amount of chemistry. Thus as a teacher he was once introduced to an intending pupil whose anxious and interested father did not want his

boy to "waste his time learning about oxygen and hydrogen and all that" but he simply wished him to "do copper." This book is not suitable for such a one, since it is primarily intended to teach analytical chemistry. Mr. Newth has already contributed two very excellent practical text-books on chemistry of a high educational order (*vide* THE LANCET, Dec. 3rd, 1892, and Dec. 22nd, 1894), and so we were not unprepared to find the present volume on qualitative and quantitative analysis to be written on the same consistent level. Moreover, his position as demonstrator in the Royal College of Science, London, gives him authority to speak on the best methods of instilling sound ideas. The directions with regard to the carrying out of an analysis, be it qualitative or quantitative, are clear and concise, attention being very properly directed to those details of manipulation which are essential to success. The first chapter is thus devoted to preliminary exercises on filtration, solution, evaporation, fusion, precipitation, ignition, and neutralisation. This is followed by the reactions of the metallic salts, the detection of the non-metals and their acids occupying chapters XI. to XVII. which concludes Book I. In Book II. will be found the directions for carrying out quantitative work (Part I.) gravimetrically and (Part II.) volumetrically (including gas analysis), while Part III. is devoted to the estimation of carbon, hydrogen, nitrogen, chlorine, and sulphur and phosphorus in organic compounds. A section is added on miscellaneous physico-chemical determinations, such as the specific gravity of solids and liquids, boiling point, melting point, and vapour density. The appendix contains tables of data useful in analysis.

The author has made the most of the space which a comparatively small volume has afforded him and the book will be found a reliable guide and an excellent companion for work at the chemical bench.

Janus. Troisième année. Première Livraison. Juillet-Août, 1898. Amsterdam: F. Van Rossen.

THIS is the first number of the third volume of the international journal which treats mainly of the history of medicine and of medical geography. Published in Amsterdam and edited by Dr. H. F. A. Peypers of that city, it contains contributions in English, French, German, and Italian, and comprises in the list of its supporters the names of well-known physicians all over the world. A paper of much interest to the English reader is that by Dr. J. F. Payne dealing with some "Letters and Fragments of Thomas Sydenham." These are four in number—namely: 1. A private letter to his friend, Dr. Gould, Fellow of Wadham College, Oxford, dated from "*Pell Mell*, Dec. 10th, '87," or two years before the death of the writer. After informing Dr. Gould of the safety in administering opiates to a variolous patient salivated by mercury Sydenham goes on to refer to his own unpopularity (surmised by the editor, Dr. Payne, to be due to his previous connexion with the Puritan party) and to the care he had taken to write nothing beyond that which was "down-right matter of fact" based on personal observation. 2. This is a petition of "Capt. Thomas Sydenham" to Oliver Cromwell, preserved in the State Paper Office. It was written in 1653 and refers to the services rendered to the cause of the Commonwealth by the petitioner and his brothers Major John Sydenham and Major Francis Sydenham, both of whom were slain in the Civil War. The petition was favourably received, the sum of £600 being awarded to Sydenham by the Council. 3. A letter to a patient whose case was deemed by Sydenham to be "only that which in men we call Hyperchondriacall, in women Hystericall ....." advising a temporary abstinence from medicine, and then, if the symptoms continued, to make trial of Peruvian bark, at the same time expressing a wish that he (the patient) might have an attack of the gout, as being of itself a "bitter but most effectual remedy." 4. The last excerpt is from some notes in English written in 1669 and criticising somewhat freely the current practice in regard to small-pox and reiterating his confidence in conclusions drawn from his own observations. "The Plague at Formosa" is the title of a brief article by Dr. J. Matignon, and Dr. Brandt writes upon the Medical Geography of African Diseases. There is also a learned account of an Antique Vase, which is of medical as well as archæological interest, by Dr. A. Kronfeld of Vienna, and the first part of an article upon the Early Periods of Anæsthesia by Dr. Cabanès. The bibliographical and other summaries are exceptionally full and varied and the number includes several plates illustrative of beri-beri at Java, which are copied from a report by Dr. Vordermann exhibiting patients suffering from the disease, the hospitals for their reception, and the kinds of rice to which the malady is attributed.

Diseases of the Kidneys and Genito-Urinary Organs. By Professor Dr. PAUL FÜRBRINGER. Translated by W. H. GILBERT, M.D. Vol. II. London: H. K. Lewis.

THE diseases of the kidneys considered in this volume are those which depend upon suppuration, calculus, tumours, and abnormalities; the remainder of the space is devoted to diseases of the bladder, urethra, and genital organs. This volume represents a large amount of labour and is filled with the different opinions of various authorities. In dealing with the results which follow a stone in the kidney more stress might with advantage have been laid on the condition of calculous anuria which usually first comes under the notice of the physician and which requires prompt recognition if surgical treatment is to be of any avail. In discussing the various operative measures in cases of calculus the advantages of nephrotomy over nephrectomy are clearly pointed out, but it would have been well also to have made the advantages of an early operation more clear, for statistics of operations clearly show that the mortality is very much less in cases which are operated upon before any definite changes have taken place in the renal tissue itself. The affections of the genital system are very fully discussed and the different indications for treatment are clearly pointed out. This volume contains a large amount of information and will prove a very useful work to all who wish to consult the principal views which are held by the different authorities of the present day. There is an excellent bibliography at the end for those who desire further references.

The Removal and Disposal of Town Refuse. By WILLIAM H. MAXWELL, Assistant Engineer and Surveyor, Leyton Urban District Council. London: The Sanitary Publishing Co., Ltd., 5, Fetter-lane, Fleet-street, E.C. 1898. Price 15*s.*

IT will be admitted that a book which includes "a *résumé* of the law bearing on the subject, a consideration of the nature of town refuse, a discussion of the various systems of its collection, and finally an investigation of the methods of its sanitary and economical disposal, or in some cases utilisation," must cover practically the whole of the ground of one very important branch at any rate of sanitary engineering. This branch, however, does not include the very wide subject of sewerage and sewage disposal, the title which Mr. Maxwell has chosen for his book referring strictly to house, trade, and street refuse; although, again, it is difficult to separate for the purpose of classification the removal and disposal of excreta where the pail, privy, cesspool or midden system is in vogue. Undoubtedly the most interesting part of the work is that dealing with

"refuse destructors," "destructor accessories," and the economic means available for utilizing the heat of combustion of waste materials, as in the application of Mr. Halpin's system of thermal storage recently installed at the Shoreditch Destructor and Electricity Station. This installation in particular is fully described on pages 327 and 328, and the engineering principles involved in the working of this ingenious system are made perfectly clear. A more miscellaneous mixture than common house garbage can hardly be imagined, and this fact largely militates against its economic destruction by heat, not to say utilisation of what fuel value it may possess for the purpose of steam-making. But considerable advance has been made in this direction only within the last few years. It was not long ago when a great proportion of London house refuse was dumped down on almost every available open space to the exceeding detriment of the inhabitants near by and the depreciation of the property. Huge henps have thus accumulated on the marshy grounds on the banks of the lower reaches of the River Thames. With the great increase in the metropolitan and suburban population the evil grew at an alarming pace and the problem had to be seriously faced. Engineering has been brought to bear upon the matter with success, and with few exceptions now "destructors" are at work on all sides. And these heat appliances in some instances are not mere "destructors" but "converters" also—that is, extracting and utilising, perhaps in the production of electric energy, any calorific value that the "rubbish" may possess. So far the dust problem has gone ahead of the sewage problem from the points of view of both disposal and utilisation. We venture to think that this is because the sewage disposal question, unlike that of garbage, is not exclusively one for engineers to approach. It requires the joint efforts of the chemist, biologist, and engineer. With this essential combination at work we may soon hope for a satisfactory solution of the sewage problem; and indeed very encouraging results, as is well known, have already been obtained as an outcome of the three aspects of the problem having been attacked in concert by experts severally concerned in the three branches of science just indicated.

But there are other matters affecting the health and comfort of the public, and with these also Mr. Maxwell deals. Indeed, it will be seen that such a book is indispensable to our local health authorities, vestries, and similar bodies, and we believe we are right in saying that it is the first really comprehensive work on the subject. On reflection this must be so, for the material in the chapters is in the main based on quite recent advances in methods of disposal and utilisation. In the first chapter the sewerage and cleansing of streets, the question of the best materia for paving streets, and the removal of snow, are amongst the important subjects touched upon. To grapple efficiently with these problems is the duty—and it is often an arduous one—of our local authorities, who in particular owe Mr. Maxwell a word of thanks, we think, for placing at their disposal so much valuable material and information on just those subjects which are of direct practical concern to them. The book is well written, well devised, and comprehensive, so far as the subject goes—and none can dispute that the subject is a broad one. Mr. Maxwell has contributed a valuable book of reference and a guide upon a most important branch of work which is closely connected with the health and well-being of the public.

De la Symphyséotomie à la Clinique Baudelocque. Dec. 7th, 1896–Dec. 7th, 1897. By Professor PINARD. Paris: G. Steinheil.

DURING the year ending Dec. 7th, 1897, the operation of symphysiotomy was performed 7 times in the Clinic Baudelocque, making a grand total of 89 such operations performed in that clinic during the six years 1892–97. Six of the cases were examples of rickety, flattened pelves, while the remaining case was one of a Naegelé oblique pelvis. Of the mothers 2 were primiparæ and 5 multiparæ; of the former 1 died from sepsis and acute albuminuria, the latter complication being present upon her admission to the clinic. All the children were born alive, 3 being delivered by forceps and 4 by version. In one patient the operation was performed for the second time, her second pregnancy having been terminated by symphysiotomy in 1892. At the first operation a tear occurred through the anterior vaginal wall into the operation wound, and at the second operation a similar accident happened in spite of every care being taken to prevent it. The urethra and bladder, however, escaped injury and the wound healed well. In the event of this patient again becoming pregnant Professor Pinard considers that Cæsarean section would be indicated on account of the cicatricial tissue present in the anterior vaginal wall. That symphysiotomy may produce some permanent enlargement of the pelvis seems to be shown by the fact that 4 of the patients delivered spontaneously during the year had previously had symphysiotomy performed upon them. The report is of interest as enabling us to watch the progress of the operation. Professor Pinard justly points out that in any future history of symphysiotomy a very important place will have to be assigned to the work done at the Clinic Baudelocque. That the operation is now established upon a firm basis is shown, he thinks, by the fact that in the discussion at the Moscow Congress no one was found to attack the favourable opinions expressed about it by Varnier, Zweifel, and Küstner.

LIBRARY TABLE.

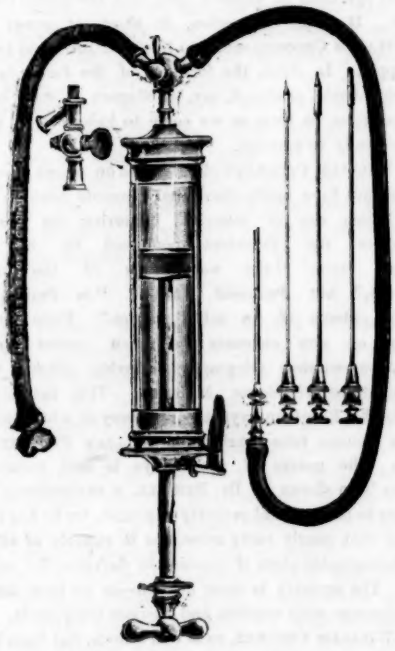
Transactions of the Reading Pathological Society, 1896–97.—The oldest pathological society in the United Kingdom has only issued two volumes of Transactions, of which the one under review is the second. It is edited by the President, Dr. H. Phillips-Conn, and the honorary secretaries, Dr. W. J. Maurice, Dr. Guilding, and Dr. J. B. Hurry. Eighteen articles are contributed by various members of the society. Perhaps the most interesting from a practical point of view is a note by Mr. H. G. Armstrong on the Distribution of the Rash in Scarlet Fever. He quotes sundry authorities, nearly all of whom say that the rash does affect the face, and one of whom (Aitken, 1880) says that the rash appears *first* on the face. Thomas of Leipsic says that the rash appears only on the temples and forehead and so does Fagge (1891). Mr. Armstrong has made notes of eleven cases with the result that he considers Thomas's opinion strictly correct. He says: "As the flush disappears on the termination of the fever the upper margin of the true exanthem may be seen on the neck just below the ramus of the jaw and occasionally on the temples and forehead at the roots of the hair, the lobes of the ears being almost always affected. ..... The rash of rubella ..... makes its first appearance on the cheeks and at the root of the nose." Mr. Armstrong thinks this a valuable diagnostic point. Dr. Alfred Ashby has a very interesting paper upon Small-pox and Vaccination.

ILFORD MEDICAL SOCIETY.—At a meeting of medical men held at Mr. M. J. Houghton's residence, it was unanimously decided to form a medical society for this district. Twelve gentlemen attended. Mr. Best was elected President, Mr. Drought treasurer, and Mr. H. Ernest Watts secretary. A small sub-committee consisting of the officers elected and three other members, Mr. Bell, Dr. Fraser, and Dr. Appleyard was also appointed. Meetings are to be held monthly at members' houses in rotation, when a paper is to be read, cases are to be shown, and medical topics discussed. The subscription is nominal. The first meeting will be held at the President's house, High-road, Ilford, on Oct. 6th, at 9 P.M.

New Inventions.

NEW ASPIRATOR.

MESSRS. ARNOLD AND SONS have made for me an aspirator which works on the Dieulafoy principle, but the nozzle of the pump is a three-way detachable tap, with the three branches arranged to exactly trisect a circle. A spring catch prevents recoil of the plunger and maintains the vacuum at 20, 40, 60, 80, or 100 cc. For exploration fix the syringe to the nozzle which lies in the continuity of the tubing, and close all the branches; then draw the plunger to the size of vacuum desired, insert the needle or trocar, and place the indicator between the ascending and middle branches. If there is fluid it will be aspirated into the syringe, then if the fluid appears to be such as would run by syphonage, place the indicator between the ascending and descending branches, and remove the syringe with a sample of the fluid, leaving the tubing and tap *in situ*. If syphonage should stop by blocking of the cannula or tubing, both limbs of the syphon can be flushed out with any antiseptic fluid from the syringe.



The advantages claimed for the instrument are as follows: 1. It allows the operator to establish syphonage by simply turning the indicator without disturbing the tubing. 2. It gives him complete control over the operation by placing the syringe at his disposal to flush out the tubing and cannula if necessary without admitting air or disturbing the tubing. 3. The spring-catch by preventing recoil of the plunger maintains the size of vacuum desired. 4. Exploration, syphonage, or aspiration and washing out a cavity can be carried out under the most perfect antiseptic conditions and without admitting air. 5. The plunger is always efficient and works smoothly. 6. By means of the three-way nozzle anyone possessed of an aspirating needle or a trocar with side branch can extemporise a more useful instrument than the ordinary Dieulafoy aspirator by means of a glass syringe and rubber tubing. 7. Compared with the bottle aspirator it has all the advantages of Dieulafoy's design for dealing with pus. 8. The whole instrument can be readily taken to pieces and sterilised.

Beeston, Notts. WILLIAM CATTO, M.B., C.M.Edin.

FACILITIES FOR CLINICAL INSTRUCTION IN INFECTIOUS DISEASES AFFORDED BY THE HOSPITALS OF THE METROPOLITAN ASYLUMS BOARD.

THE study of infectious disease is a very necessary part of the student's curriculum, but it is only within recent years that proper facilities have been afforded for taking advantage of the valuable material to be found in the fever hospitals of the Metropolitan Asylums Board. In former years the student had but few opportunities of becoming familiar with the natural history of this branch of medicine, and it was by no means an unheard-of event for a student to complete his career without having seen half a dozen cases of infectious disease. That there is still evidence of the state of affairs which formerly obtained may be gathered from the fact that during 1895 no fewer than 1277 patients, or a percentage on the total admission into the Metropolitan Fever Hospitals of 7·6, were, after admission, found not to be suffering from the diseases mentioned in the medical certificates upon which they were removed to hospital, the percentage of mistakes at the Eastern Hospital at Homerton being 11·0 of the total admissions. At the present time five of the admirable hospitals of the Asylums Board—viz., the Eastern at Homerton, the Western at Fulham, the South-Eastern at Deptford, the South-Western at Stockwell, and the North-Western at Hampstead, are open under certain conditions to students and medical practitioners, while instruction in small-pox is also afforded at the small-pox ships in the Long Reach, near Dartford. A student desirous of taking a course at one of the Board's hospitals must have completed his third year and have held the offices of clinical clerk and dresser; he must then obtain the sanction of the medical school to which he belongs and pay a fee of three guineas for the first three months, and one guinea for each subsequent month to the clerk of the board, from whom he receives a card indicating the hospital to which he is to be attached. At this hospital he must attend at stated times for at least two days in the week for a minimum period of two months, and on the completion of his attendance he receives a certificate from the medical superintendent whose lectures and classes he has attended. While in the hospital the student places himself under the control of the medical superintendent, and is bound to observe the regulations in force for the prevention of spread of infection. These rules comprise the wearing while within the hospital wards of brown holland overalls, consisting of coat, trousers, and cap, which are provided by the board, and the use of what may be termed a discharge block, which consists of an infected room where the overalls are left, a lavatory, and a theoretically uninfected room. The students are further required to keep their hair short and to be efficiently protected against small-pox. A duly qualified medical practitioner has equally to conform to these regulations and must obtain the consent of the medical superintendent of the hospital at which he elects to attend. The student who attends these courses will obtain a fair knowledge of infectious disease, which will stand him in good stead in years to come, while he will also get an insight into the management of fever hospitals and the methods of disinfection practised therein.

The provisions with regard to instruction in small-pox differ somewhat from the above, as it is necessary for the student to reside for from two to four weeks on the small-pox ships, where he is provided with rations, apartments, and washing at the extremely moderate sum of 12*s.* per week. The student has to travel to and from the hospital ships on the ambulance steamer and to furnish himself with a suit of clothes to which he does not attach much value, in order that it may be disinfected or destroyed at the termination of the period.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 10, 1898.

FOR those of all creeds there is wealth of material for profound thought in the admirable and comprehensive Presidential Address which Sir WILLIAM CROOKES, F.R.S., V.P.C.S., delivered before the British Association for the Advancement of Science at Bristol on Wednesday. Sir WILLIAM CROOKES has devoted his life to science and his laborious and painstaking researches have, as is well known in all scientific circles, borne abundant fruit mainly in the direction of throwing more light on the constitution of matter and on the evolution of the elements. This is not the only occasion upon which Sir WILLIAM CROOKES has addressed the British Association. More than a decade ago at a similar meeting he ventured the hypothesis of the so-called meta-elements, ascribing the apparent fluctuation of atomic weights to groups of atoms comprising, so to speak, a cluster round one common number. Then there were indications occurring in his masterly researches of the atomic value of the same element differing slightly, a circumstance which would quite account for the difficulty of raising the supposition of PROUT from the grade of hypothesis to that of a theory. The genesis of the elements, however, formed but a small part of the address at Bristol, though the President made a very important announcement as the result of the exceedingly penetrating character of his spectroscopic studies. The air just now would seem to be full of new elements, most of which appear to be of a singularly inert type; but Sir WILLIAM CROOKES announced the appearance of a new element occurring in the rare earths which he proposes to call "monium." He says it has a marked individuality, but although so young and wilful "it is willing to enter into any number of chemical alliances." He apologised for adding yet another element to an already long list, but when we regard them, he added, in the light of component parts of a dominant element, frozen in embryo, and arrested in the act of coalescing from the original protyle into one of the ordinary law-abiding families for whom NEWLANDS and MENDELÉEF have prepared pigeon-holes, they arise to supreme importance.

Recent events and public discussion of a matter of great national importance have evidently prompted the eminent chemist to choose as part of his Presidential Address the question of food supply. At the outset Sir WILLIAM CROOKES was decidedly pessimistic as to future demands being supplied by the ordinary methods of agriculture. It is the chemist, he asserts, who must come to the rescue of the threatened communities. In other words, it is through the laboratory that starvation may ultimately be turned into plenty. Sir WILLIAM CROOKES looks upon the exhaustion of the world's stock of fixed nitrogen as a matter of far greater importance than the exhaustion of British coal-fields. The former would mean not only a catastrophe little short of starvation for the wheat-eaters, but indirectly scarcity for those who exist on inferior grains together with a lower standard of living for meat-eaters, scarcity of mutton and beef and even the extinction of gunpowder. Every square yard of the earth's surface has nitrogen gas pressing upon it to the extent of about seven tons, but in the *free* state, and wheat demands it *fixed*. In the free gaseous state nitrogen is worthless, but 27 tons weight in the atmosphere combined in the form of sodium nitrate would be worth £2000. The question arises, How, then, are we to utilise the abundant element for such a mighty purpose? Sir WILLIAM CROOKES showed some time ago that the nitrogen of the air could be converted directly into nitrous and nitric acids by passing a strong induction current through ordinary air, when it takes fire and burns with a powerful flame. This inconsiderable experiment, he mentioned, may not unlikely lead to the development of a mighty industry destined to solve the great food problem. The suggestion makes the recent announcement of the alleged synthesis of albumin pale into the merest insignificance. It is all a question, in short, of power which Sir WILLIAM CROOKES seems to think Nature could be made to supply. In short, the fertiliser of the future is to be electric nitrate produced, say, by Niagara or some colossal natural force as soon as we come to know how to turn it economically to account.

Sir WILLIAM CROOKES's observations on recent researches which have bred newly-discovered elements such as argon and helion are of interest. Referring to his own researches the President confessed he had been engaged upon "the waste-heaps of the mineral elements," but Professor RAMSAY "is dealing with vagrant atoms of an astral nature." From the discovery of new elements he then passed to new vibrations—wireless telegraphy—referring chiefly to the investigations of Signor MARCONI. This naturally led him to the Roentgen rays, the discovery of which was due to the vacuum tube bearing Sir WILLIAM CROOKES's own name. The nature of these rays is still unfathomed. As has been shown by Dr. RUSSELL, a ray-emitting power appears to be a general property of matter, for he has demonstrated that nearly every substance is capable of affecting the photographic plate if exposed in darkness for sufficient time. The property is most marked—as we have shown in our columns—with uranium and thorium compounds,

Sir WILLIAM CROOKES, as is well known, has been bold in expressing his views on what most people consider to be occult subjects and he has been taken to task for his attitude as a scientific man on these questions. He has been silent for some time, but he evidently felt that the trend of public thought has changed, and so he reverted to a subject which has recently attracted the attention of recognised men of science. Sir WILLIAM CROOKES believes the fundamental law of telepathy to be "that thoughts and images may be transferred from one mind to another without the agency of the recognised organs of sense, that knowledge may enter the human mind without being communicated in any hitherto known or recognised ways." The subject obviously presents

many difficulties in the way of practical inquiry, investigation, and elucidation; but we do not doubt that some are prepared to accept this postulate. Molecular movements occur in the brain during thought processes and it is conceivable that physical vibrations are set up capable from their extreme minuteness of acting directly on individual molecules, while their rapidity approaches that of the internal and external movements of the atoms themselves. We need only refer to the Roentgen ray phenomena and the transmission of electric waves without wires in order to find an analogy which lends considerable assistance to the idea.

It will be conceded that in spite of the wide range of subjects which the President thought fit to include in his highly interesting address, yet he preserved with conspicuous success a continuity of reasoning and thought throughout. The subjects touched upon were such as will provide abundant opportunities for reflection for all classes of thinking people. The address bristles with some of those fascinating suggestions which have arisen as the outcome of the enormous progress of scientific research during the last few years. Sir WILLIAM CROOKES has crystallised into characteristically simple language these advances, and his eloquent peroration should afford a powerful stimulus to all those engaged in wresting the hidden secrets from Nature. "Steadily, unflinchingly, we strive to pierce the inmost heart of nature, from what she is to re-construct what she has been, and to prophesy what she yet shall be. Veil after veil we have lifted and her face grows more beautiful, august, and wonderful, with every barrier that is withdrawn."

WE have recently[1] had occasion to notice the interesting and beautiful geological model of London and its suburbs constructed by Mr. JAMES B. JORDAN, F.G.S. This gentleman is well and favourably known to meteorologists by his contributions to their branch of science, by his invention of the glycerine barometer, the daily records of which are published in the *Times*, and by his admirable photographic sunshine recorder, both of which are known by his name. He is, perhaps, better remembered by medical men as the joint author with the late Mr. WILLIAM TOPLEY, F.G.S., of the "Geological Survey of England and Wales," of the excellent geological models of the south-eastern portion of England, including the Wealden district,[2] and of the Thames Valley, which last, as Sir A. C. RAMSAY, LL.D., F.R.S., states, clearly explains the relation of the river to the geological formations through which it has cut its way from source to sea. In all these models London is well represented and this reminds us of the splendid geological model of London which stands in the Museum of Practical Geology, 28, Jermyn-street, St. James's, S.W., where it attracts annually many visitors, who, owing to its large scale—six inches to one mile—are able to satisfy themselves as to the altitude above sea level and the nature of the geological formation of any locality in which they may be interested, the names of the streets, roads, parks, &c., being legibly engraved on the map before them. Then, again, the model is so constructed that not only are the more deeply seated rocks shown in coloured sections along the four sides of the model, but mechanical contrivance is resorted to by which the separate blocks of the model into which it is divided are capable of being raised above the surface, so as to expose other sections in various parts of the London area. This model has been described by Mr. W. WHITAKER, F.R.S., in his valuable work on "The Geology of London," who also adds Mr. J. B. JORDAN'S account of the constructional arrangements which he carried out in making it. All these models, therefore, it will be at once conceived, cannot fail to impress upon the geological student the local and general facts associated with the several areas represented and consequently are of eminent service to him. But their usefulness is not confined to these geological teachings; in these days of progress in sanitary science members of our profession gladly welcome such models, as they open up a vast field of inquiry as to the relations which exist between the soils and subsoils of defined areas and the various causes of disease prevailing within them.

Let us, then, see how these geological models can be applied to the practical requirements of the medical man whilst studying the statistics of disease within the areas they represent, and for this purpose we will include the map lately published by Mr. HORACE B. WOODWARD, F.R.S., to illustrate his admirable memoir on "Soils and Subsoils from a Sanitary Point of View; with Especial Reference to London and its Neighbourhood,"[3] reviewed in THE LANCET of Feb. 5th (p. 372). The horizontal scale of Messrs. TOPLEY and JORDAN'S geological model of the south-east of England is four miles to the inch, the same as that of the index map of the Ordnance and Geological Surveys; Mr. WOODWARD'S map just referred to is on the same scale. In 1888 the Ordnance Survey Office, Southampton, issued a series of Diagrams of the Sanitary (Registration) Districts in each county of England and Wales, showing also the boundaries of the civil parishes contained in each on the same scale as the index map, the boundaries of the registration or sanitary districts being coloured red and those of borough or other urban sanitary districts brown and blue respectively. Now if a clear piece of tracing-paper or linen be taken and applied to any of these diagrams a correct copy of the boundaries of the districts can be made in red ink, and when completed applied to the map or model so as to enable us to study the geological colouring and the physical configuration of the area comprehended within the boundaries of each district as they appear to us through the transparent paper or linen on which the boundaries are defined; in some instances glass may be used when the boundaries have been drawn on it. As a matter of detail it is necessary to trace the courses of some of the characteristic rivers, such as the Thames, in the model and map selected, so as to enable us accurately to adjust the tracing to the map or model. Mr. JORDAN'S model of London and its suburbs above referred to is on the larger scale of one mile to an inch, but

[1] THE LANCET, July 16th, 1898, p. 162.
[2] London: E. Stanford.
[3] London: Eyre and Spottiswoode.

the method which we have explained is equally applicable to it when the boundary lines of the several districts on the same scale have been procured. We believe that for many years the above method has been adopted by Mr. ALFRED HAVILAND in studying the medical geography of Great Britain.

It will be evident to our readers that such relief maps as we have briefly noticed cannot fail to be of great usefulness in the study of the physical configuration and geological structure of a country in relation to the causes of disease. The all-important factor in local climate—aspect—is at once grasped through their means, and all can appreciate the value of such a help in this direction; again, the pent-in valley systems, where natural air-flushing is defective on account of the obstruction offered to prevailing winds, are displayed before us as if we were viewing them from one of the surrounding heights. Eleven years ago, at a meeting of the Scottish Meteorological Society in Edinburgh, it was proposed to select sites for the outdoor treatment of the phthisical, and it was urged that the country should be well and carefully studied with the view of selecting sites for buildings devoted to this purpose; in such a selection the advantages offered by relief maps would be incalculable as they facilitate the process of eliminating inappropriate sites at once and thus afford more time for the critical examination of others which promise to fulfil the required conditions of aspect, altitude, soil and protection from adverse winds. In these days when an effort is being made to disseminate knowledge with regard to the prophylaxis of tuberculosis, which has hitherto been ever amongst us, ravaging and despoiling our population, it is to be hoped that the publication of relief maps will be undertaken by the Government and not be left to private enterprise, as hitherto has been the case. Then, again, in that wide field of research, bacteriology, these geological models present an opportunity to our profession to study the habitats of those "hidden foes" which make so great a mark on our death-rates and the natural history of which as regards their relation to soil remains as yet almost a *terra incognita*.

OMDURMAN has fallen, the Egyptian flag and the British standard are flying at Khartoum, the great Dervish army has been utterly defeated, the Khalifa is a fugitive, the neck of a cruel and oppressive tyranny has been broken, and, to the relief of all, and especially of the unhappy inhabitants of the Soudan, there is a complete and final end to the power and prestige of Madhism. Such, briefly summarised, is the welcome news from Egypt which has given rise to a sense of relief and rejoicing in this country and to much unstinted praise on the continent of Europe and in the United States of America. We do not think that the situation could be more tersely or generously stated than has been done in a Paris paper—the *Temps*—which recognises that it was a real *tour de force* to bring so far from its base into the desert, and especially by the Nile, the course of which is so frequently broken by cataracts and studded with rocks, an army perfectly equipped, in admirable training, and in the best of sanitary conditions. All had, it says, been foreseen, calculated, and regulated by the simplest means and according to a general plan so scientific that the march may be likened to the solution of a mathematical equation. That the difficulties which have been encountered in transporting a large army equipped with all the weapons and appliances of modern warfare some twelve hundred miles have been successfully overcome so that the Khalifa's army has been utterly defeated outside his capital with relatively little loss to the force under Sir HERBERT KITCHENER'S command is no doubt a striking military achievement of which any nation may well feel proud.

On the design, organisation, and conduct of the campaign the tactical skill o the general, and the discipline and gallantry of his troops there is no need to dwell. The nation is to be congratulated on having such an army as that which fought at Omdurman and the army is to be congratulated on having found a general of such conspicuous ability as Sir HERBERT KITCHENER. But we may legitimately refer to the medical arrangements for the expeditionary force, which seem to have been admirably carried out. If our campaigns in various parts of the world since the Crimean war be compared with those of other nations the British medical service will have no cause to feel ashamed of the results of the comparison. So long as war is war and military success is necessarily its first object it is futile to expect that army hospitals can be equipped with such an elaboration of comfort as to leave nothing to be desired, nor indeed is it to be wished that soldiers on service should keep pace with the habits of a luxurious age. All that is practically attainable should, however, be provided, and we are glad to recognise that every succeeding war shows a progressive improvement in these respects. By lessons of experience we have been schooled into forethought and attention to medical and sanitary details with the result that we have been steadily but surely improving in the management of our small campaigns and military expeditions. Time is no doubt an important element, for success is in proportion to preparation. The more unexpected and sudden the outbreak of war and the more rapid the conduct of a campaign the harder it obviously becomes for all branches of the military service, and especially for the medical transport and supply branches, to fulfil the requirements of an expedition. The Soudan campaign no doubt gave time for the needful preparation, of which apparently full advantage was taken, for it is probable that no force was ever better or more completely organised and equipped in these respects than the force which went to Omdurman under Sir HERBERT KITCHENER.

We congratulate the officers of the Royal Army Medical Corps on their share in the successful issue. The total number of casualties among the Anglo-Egyptian forces at Omdurman was 387. The British killed were 2 officers and 23 rank and file, while 7 officers and 99 rank and file were wounded. 6 British officers attached to the Egyptian army were wounded—137 British casualties in all. We much regret to notice the name of Lieutenant-Colonel A. J. SLOGGETT, R.A.M.C., among the list of severely wounded and trust that he may speedily recover. Lieutenant-Colonel SLOGGETT was the senior medical officer

with the First Brigade under the command of Brigadier-General WAUCHOPE, C.B., and had been previously mentioned in despatches for his services in the Dongola campaign. Now that the Royal Army Medical Corps is for the first time an amalgamated corps we should not omit to mention that a private and lance-corporal of that corps were also among the wounded. It will be seen, at any rate, that the officers and men of the Royal Army Medical Corps run all the risks of battle in addition to those which they specially incur from the nature of their calling. Sir HERBERT KITCHENER in a telegraphic despatch from Omdurman of Sept. 4th says that "the British wounded have all left for Abadia in barges towed by steamers. I saw them before leaving and they were all doing well and were comfortable." We venture to add an expression of sympathy with the *Times* on its loss of the services of two of its war correspondents, one of whom was killed and the other severely wounded.

Annotations.

"Ne quid nimis."

THE WATER FAMINE IN NORTH-EAST LONDON.

THE situation in the district supplied by the East London Waterworks Company has not altered for the better since we described it a fortnight ago, for the heavens still refuse rain. That it has not altered materially for the worse and that the public health remains fair must be looked upon as a piece of good fortune for the company commensurate at least with the bad fortune which they are experiencing in running short of water during a drought. For if an epidemic of any kind should break out in north-east London the medical men would have hard work to keep the mischief under when deprived of the most natural and efficacious remedy against zymotic diseases—water. Proceedings are now being taken to place the mains of the company in communication direct or indirect with those of two other companies, and when this has been done all fear of an absolute water-famine will be at an end. But with the tiding over of the temporary difficulty we hope that the occurrence of these annual breakdowns will not pass from the recollection of the people of London. They ought not to occur, and if the company cannot prevent them the company would appear to be unable to carry on its business. There is an alternative. It may be said that the company can manage its works at least as well as any municipal or central body would be able to manage them, but that if there is not the water the water cannot be supplied. In this way the relations during the last two or three summers of the East London Waterworks Company with their clients form a strong argument for the augmentation or alteration of the present source of the metropolitan water-supply.

SCIENCE AND MEDICINE.

DR. KANTHACK, Professor of Pathology at the University of Cambridge, recently delivered the mid-sessional address before the Abernethian Society of St. Bartholomew's Hospital. He chose for his subject "The Science and Art of Medicine" and the whole discourse was an earnest and impassioned plea for the more scientific teaching of medicine and for the impressing upon students the necessity of finding out if possible everything about a patient which can have any bearing on the case. Dr. Kanthack drew a parallel between medicine and a technical industry such as brewing. An art, he said, may be learned in two ways: first, by experience based on a rule of thumb principle, which is the English way; and secondly, by experience based upon systematic research, which is the German way. Citing Hansen's great work in revolutionising the brewing industry at Copenhagen Dr. Kanthack proceeded to point out that the more we know about fermentation the more we shall know about disease, for infection is merely a form of fermentation. In our happy-go-lucky British fashion we do manage somehow to get good beer, though the average English ale, to say nothing of Scotch ale, is somewhat heavy for this weather. But there is one technical industry in which a real knowledge of fermentation would be of infinite assistance, and that is bread-making. Why is it that ordinary baker's bread is simply uneatable after it has been baked two days? If it were made of good flour, good water, and carefully selected yeast it should keep quite fresh three or four days. There is at least one bakery, and there may be more, which pays attention to the yeast question, but everybody knows the usual stuff proffered as "bread." To return to Dr. Kanthack. He gave as another example the work done in Denmark, a small and poor country, with regard to the great tuberculosis question and compared it with what we are doing over here. True we have had a Royal Commission which has issued a report, and so, we might add, have we had a Commission on Vaccination, but neither of them have at present had very beneficial results. "Pathology," said Dr. Kanthack, "is not a subject of secondary importance inferior to practical medicine or surgery; it is the foundation of diagnosis, treatment, and prognosis." The late Dr. James Andrew, as sound a physician as ever lived, used always to tell his clerks that there was no place for learning like the post-mortem room and his admirable clinical teaching was always based upon scientific research. Another of his maxims was that the best book on medicine was Foster's Physiology, neither can there be any doubt of the truth of this. Even since his death the opportunities and advances of scientific research have increased enormously, and we can only hope that Dr. Kanthack's words will be taken to heart not only by his student audience but by those in whose hands lies the future training of our young medical men. With all our knowledge we are still very much in the dark about the causes and processes of disease. It is the "why" we must seek for; when we have found this we shall be better able to say how to treat it and for this reason we must inculcate research upon the learner.

SALE OF DRINK TO CHILDREN.

A CORRESPONDENT writes to us referring to our annotation in THE LANCET of August 27th entitled "Drink-fetching by Children." "It may be mentioned," he says, "that two deputations, one representing the temperance party and the other the licensed victuallers, have laid their views before the Manchester city justices. The latter deputation suggested that if any such intimation were necessary it should go forth through the press and not by circular, 'that it was the desire of the magistrates that vendors of liquor, wholesale or retail, should exercise care not to serve children of very tender years and should use their influence to minimise as far as possible what the temperance party considered to be a great evil.' One of the deputation stated that the Licensed Victuallers' Association had already issued a circular urging their members not to give sweets or toys to the children sent to their houses. He also said that if one licence-holder refused to serve children his neighbour might do so. Another said the restrictions placed on licencees had been the means of creating bogus

clubs, to which 'young persons'—a euphemism probably for children—were sent for drink. The representative of Gilbey's mentioned the case of a licencee who refused to supply children under thirteen years of age and found they were sent to neighbouring clubs, so that he had through declining trade to sell his business. No doubt it is a difficult question to settle. It would be simplified if alcoholic drinks were only taken 'when necessary,' but necessity would in that case no doubt very frequently arise. The Lord Mayor complimented both deputations on the moderation with which their views had been expressed. In addressing his colleagues he said he need not remind them that there was no law to compel a publican to refuse to sell drink to children under thirteen for outdoor consumption. He assumed that they would not dream of sending out any circular instructing publicans not to supply such children, but there was no reason why they should not instruct the chief constable to issue one asking all licencees to assist the justices by refusing as far as possible to sell drink to children under thirteen. He moved the following resolution: 'That the justices of this city, assembled in special meeting for licensing purposes, desire to express their opinion, with which they feel sure all licencees will agree, that it is undesirable in the common interests of morality and good government to serve liquor to children under thirteen years of age, and most earnestly request that all licencees will assist the justices in carrying out this very laudable object to the best of their ability.' In the discussion which followed there was a general agreement with the views of the Lord Mayor. Dr. Woodcock thought that 'their first consideration ought to be, not the convenience of the parents, but the future well-being of the children.' Mr. Shann said that a statement had been made to the Licensing Committee that in three-quarters of an hour on Sunday afternoon nearly 250 children between the ages of three and twelve had been served with beer at the public-houses in one street and most of them were seen to sip the beer as they took it home. It will take a long time for the mass of the people to learn that drink is a luxury, not a necessity, not always harmless, and all the more that the legislation concerning it was enacted in pre-scientific days when it was an almost universal article of belief that alcohol in some form was a necessary of life. People take drink, of course, because they like it, the educated ignoring the evidence of its being one of the chief causes of crime and physical deterioration, while the uneducated have temptations to drink that the 'better classes' know little about."

THE SEVENTH SON.

IT is comforting to see that Board schools and the spread of education have not yet altogether killed romance. On Sept. 2nd a weaver named "Doctor" Talbot was charged at Southwark Police-court with travelling on the railway without having paid his fare. The prisoner said that "Doctor" was his Christian name and he had had it given him because he was the seventh son of a seventh son, and therefore possessed the gift of healing. This is a very old belief and was sometimes varied by being applied to a seventh male child in succession, whether or no his father had been in like case. In *Notes and Queries*, June 12th, 1852, appeared the following: "In Saltash-street, Plymouth, my friend copied on Dec. 10th, 1851, the following inscription: 'A. Shepherd, the third seventh daughter, Doctress.'" In Lupton's "Notable Things," ed. 1660, we find: "It is manifest by experience that the seventh male child by just order (never a girl or wench being born between) doth heal only with touching, through a natural gift, the king's evil, which is a special gift of God, given to kings and queens, as daily experience doth witnesse." In France, especially in the Orleans district, the seventh son is called a *marcou*, he possesses healing powers, and is marked on the left side with a fleur-de-lys. On the Border the seventh son is marked with the seven stars and it is interesting to find that individuals of this class not only possess inherent healing powers but it is the usual custom to bring them up as "doctors." Wrightson, the Wise Man of Stokesley, who flourished some seventy years ago, was a seventh son. The belief is only one of the innumerable beliefs connected with the number seven. So numerous are these that a narration of them all would fill a volume of THE LANCET, but we may mention a few of them. From the very earliest ages the seven great planets were known and ruled this world and the dwellers in it, and their number entered into every conceivable matter that concerned man. There are seven days in the week, "seven holes in the head for the master stars are seven," seven ages both for man and the world in which he lives. There were seven material heavens and in the underworld described by Dante, the great Pagan dead who were not good enough for heaven or bad enough for hell reposed in a seven-walled and seven-gated city. There are seven colours in the spectrum and seven notes in the diatonic octave and the "leading" note of the scale is the seventh. Be it noted that the seventh son is not always gifted with beneficent powers. In Portugal he is believed to be subject to the powers of darkness and to be compelled every Saturday evening to assume the likeness of an ass. Wild and dreamy as all these legends and ideas are it is not impossible that underlying an almost universal belief there should be some substratum of truth. As Sir William Crookes reminds us, there are powers and influences of which we know nothing. The eye is insensible to the ultra violet rays which yet we know to exist. To quote Epictetus, "A little soul, for a little, bears up this corpse which is man," and this earth and all upon it is but a speck of dust in the vast expanse of the universe.

BOULIMIA.

ON August 27th an inquest was held by Mr. Negus Wood at Plumstead upon the body of William Ward, aged eighty-four years, an army pensioner, who died from asphyxia. At the post-mortem examination three pieces of meat measuring in all 12 in. in length were found in the deceased's "throat." Evidence was given that the deceased was always a gluttonous feeder and in the habit of bolting his food. His daughter-in-law said that she used to mince his food, but that even then he would bolt such large spoonfuls that he had to gasp for breath. A verdict was returned of "Accidental death." Instances of ravenous appetite are not uncommon, constituting the condition known as boulimia or bulimy, moreover this craving for food substances is sometimes associated with another condition known as polyphagism, when the sufferer eats pins, string, broken bottles, and other indigestible articles. In THE LANCET for May 5th, 1894, we commented upon the death of a man in the London Hospital whose stomach was found after death to be full of a heterogeneous mass of these things. Certain tribes in South America are known as earth-eaters from the habit they have of filling their stomachs with clay, and the custom of gorging is common among peoples who live a precarious life and scarcely know from one day to another when they will get another meal. Dr. Kane relates the case of an Esquimaux who ate an enormous quantity of walrus flesh and blubber, and in 1799 there was a French prisoner in England, by name Charles Domery, one of nine brothers who with their father were all remarkable for voracious appetite. One day he was allowed as much to eat as he liked and between 4 A.M. and 6 P.M. consumed 4 lb. of raw cow's udder, 10 lb. of raw beef, 2 lb. of candles, and five bottles of porter. The narrator remarks: "It is

also to be observed that the day was hot, and not having his usual exercise in the yard, it may be presumed he would otherwise have had a better appetite." When unable to procure rational food he was accustomed to eat rats, cats, and dogs, and upon one occasion, when in action on board ship, feeling himself hungry, he began to eat the leg of a man, which limb had been shot off and was lying handy. We fancy the custom still exists in some parts of the country of having hasty pudding eating matches, and at a certain college in Oxford the following rite obtains or used to do twenty years ago. On Mid Lent Sunday the first lesson in the evening is Genesis xliii., which gives an account of Benjamin's mess, which was five times as great as any of the other's. Furmenty was always served in Hall on that evening, and the junior man at each table was considered as Benjamin and served with an enormous helping. If he ate it all he could "sconce"—i.e., fine the whole table in sherry—if he could not he was himself fined. When this custom originated no one knows, but it is probably like so many other old customs a remnant of paganism with a veneer of Christianity over it.

REPORT OF THE ASYLUMS COMMITTEE OF THE LONDON COUNTY COUNCIL.

THE ninth annual report of the Asylums Committee of the London County Council, presented to the Council on May 17th, 1898, has just reached us. The report deals with the following seven institutions: Banstead, Cane-hill, Claybury, Colney Hatch, Hanwell, The Heath (Bexley), and Horton. The most serious feature of the report is the marked increase in the number of lunatics chargeable to the County of London and its various parishes. Thus the total number on Jan. 1st, 1898, was 20,482, while on Jan. 1st, 1897, the total number was 19,937. There was thus an increase in 1897 of 545. Want of accommodation caused on Jan. 1st, 1898, 1526 lunatics to be boarded out at a cost of some £31,000 per annum, but every effort is being made to provide accommodation. Up to March 31st, 1898, 1284 lunatics were residing in asylums other than those belonging to the County of London. The total number under treatment in the seven above-mentioned asylums was 14,557 and the percentage of recoveries 7·85. We are glad to see that the salaries of the assistant medical officers have been increased, the scale of payments now being from £300 to £400 per annum for the first assistant medical officer down to £150 per annum for the fifth assistant medical officer and all appointments under. With regard to the Lunacy Bill reintroduced this session the report says: "In its present form we felt it our duty to again recommend opposition." Dr. F. W. Mott, the pathologist, whose duties were sadly interfered with by a severe attack of enteric fever, appends a most interesting report which we hope to notice more fully in a future issue. The table of the various occupations of patients shows that the largest number in any one class was supplied by, to make use of somewhat of a bull, females of no occupation. Of these there were 422. The next largest class is supplied by female servants, who number 216. Among the males labourers supplied 206; those of no occupation, 87; seamen, 24; boot- and shoe-makers, 21. There were two clerks in holy orders and one medical student. Alcoholic intemperance would seem to be the most active cause of insanity; starvation and privation give very low figures except at Claybury, where 35 patients were admitted with this as the exciting cause. Dr. Mott's report deals chiefly with the pathological features observed post mortem in cases of general paralysis. He also made some observations upon the urine and found that during the seizures of general paralysis there was often present an increase in the quantity of aromatic sulphates in the urine. Dr. Mott thinks that this may be due to tissue waste. As far as the nervous system goes, however, Dr. Wakelin Barratt examined a number of vagus nerves together with the cardiac branches of the sympathetic and with one doubtful exception found no degeneration. Degeneration of the peripheral nerves is not often found, says Dr. Mott, in general paralysis except in tabetic cases. In one case where a symmetrical bullous eruption was present there was shown degeneration of the anterior crural nerve and its corresponding spinal ganglia. Microscopic examination of the brain from patients who had died from general paralysis showed (1) bio-chemical and necro-biotic changes in the cells; (2) degeneration of the tangential system of fibres; (3) changes in the vessels and neuroglia cells. Portions of brains in which all the vessels had been ligatured in order to produce complete anæmia were also examined and changes were found in the nerve cells similar to those observed in the brains of patients who had suffered from general paralysis, except of course that there had not been time enough for the proliferation of the neuroglia cells. With regard to syphilis as a cause of general paralysis as well as of tabes dorsalis Dr. Mott found that in some interesting cases of general paralysis which he examined he could generally obtain a history of venereal infection. In 10 cases of juvenile general paralysis 8 showed undoubted signs of congenital syphilis. Atheroma is common in general paralysis, but cerebral hæmorrhage is very uncommon. This Dr. Mott attributes to the fact that cardiac hypertrophy is uncommon also. Another disease rarely seen in asylum practice is hepatic cirrhosis, although abuse of alcohol admittedly plays a large part in the production of insanity. Dr. Mott considers that the patients admitted to asylums suffer from an hereditary neuropathy and that alcohol produces toxic effects upon their nervous system long before cirrhosis of the liver can be brought about. Syphilis is by far the most important cause of organic brain disease in persons not much past middle life. It acts in various ways: (1) by causing specific arteritis, (2) by causing meningitis, and (3) by the formation of gummatous growths.

SUPPURATIVE SPLENITIS.

IN the *Maryland Medical Journal* of August 13th Dr. B. M. Cromwell, of Eckhart Mines, Maryland, describes a case of suppurative splenitis caused by tight-lacing and violent exercise, which was successfully treated by operation. The patient was a strong, healthy girl, seventeen years of age, who in order to escape an impending shower ran for the greater part of a mile on a hot day in August, 1897. After running for some time she felt a pain in her left side, and reached home in a state of more or less collapse. The pain ceased before she reached home and did not return until the next day, after which it was continuous. Dr. Cromwell, on examining her two or three days afterwards, found a deep sulcus about the margin of the ribs, and in answer to his inquiries the girl explained that while she was running her corset was loose enough but the band of her petticoat was too short and she had to pull it very tight to button it. Above and below the sulcus there was a marked tumefaction. Percussion revealed dulness over the whole of the left side, extending to near the brim of the pelvis and anteriorly to near the median line of the abdomen. The edge of the tumefied spleen could be plainly felt around the greater part of this dull space. The diagnosis was an enlarged and inflamed spleen, and as no improvement followed from iodine ointment and blistering an incision was carried through the abdominal parietes into the substance of the spleen. At first there was a copious flow of bright arterial blood, then a small ribbon of pus was mixed with it, and as the pus increased in quantity the blood diminished until the escaping fluid consisted entirely

of pus, which continued to be discharged for many days under the influence of poultices, and for several days after it ceased there was a discharge of serum. The total amount of blood, pus, and serum was estimated at about 30 oz. The girl made a good recovery and is now in excellent health.

EVIDENCE AT INQUESTS AS TO CAUSE OF DEATH.

ON Sept. 2nd Mr. J. E. Hill, deputy coroner, held an inquest at Huddersfield upon the body of Hervin Hoyle, who died after being crushed by the fall of a door in a mill. The door in question was a sliding one hung by a counterpoise. Deceased was trying to pull it down when it suddenly descended with great force and deceased was caught underneath it. The door caught him across the chest and he called for help, but he died ten minutes after he was got out. Evidence was given that the chain of the door had slipped off the pulley. Another witness said that he had examined the place of the accident and could not arrive at its cause. The cream of the evidence, however, is the following, which we give together with the verdict in the words of the *Huddersfield Weekly News*: "Sarah Jowett, who laid out the body, said the spinal cord was broken." The jury returned a verdict, "That the deceased died from fracture of the spine, caused by the accidental falling of a door." Apparently no medical evidence was called at this inquest, and although Sarah Jowett may be able to say as her great namesake was made to say in the oft-quoted lines—

> "My name is ..... Jowett;
> Whatever is known, I know it,"

yet we do not think that her evidence is enough to satisfy scientific requirements.

THE JOYS OF PLAGUE NURSING.

WE should like to know why it is that a vestry or a municipality though it may be composed of gentlemen in its units seems to act in its corporate capacity in a manner in which no gentleman would ever think of doing and also in a hopelessly unbusiness-like fashion. The subjoined rules have been issued for the guidance of the Nursing Sisters who are helping to combat the plague in Calcutta and are printed as reported in the *Bombay Gazette* of July 11th:—

RULES FOR THE GUIDANCE OF LADY DOCTOR AND SISTERS.

The lady doctor is responsible to the medical officer of health and the chairman of the municipality for the good conduct of the establishment, and it is trusted that the sisters will cordially support her.

2. Sisters wishing to communicate with the authorities must do so through the lady doctor.

3. Sisters must be in to dinner every night and must not leave the premises after dinner, except with the leave of the lady doctor. Such leave will not be granted more than once a week and then only till 11 P.M., except under very special circumstances: the address at which the sister will be must be given to the lady doctor.

4. Sisters going out driving are required to let the lady doctor know their destination and their escort (if any): and she is given authority to modify the arrangements made, if she shall deem it necessary.

5. Visitors to the sisters must send in their card to the lady doctor.

6. Sisters to be in bed by 11 P.M.

7. In case of sickness the lady doctor is to be at once informed and she shall, if she shall deem it necessary, or if the sisters shall desire it, call in one of the senior medical practitioners of Calcutta; she shall also make such arrangements for the invalid as shall appear necessary, with the advice of the medical attendant, subject to the approval of the medical officer of health.

8. The household expenses are to be provided for by a fixed contribution from each person to be made as soon as the monthly salaries are paid. The payment to be made through the lady doctor.

9. At present each person is to contribute Rs.110 a month for board, lodging, light, and fuel and use of the servants provided by the landlady.

10. Personal servants, punkhawallahs, ice, and wines and aerated waters, dhobee and ghari hire to be provided by each person for herself.

11. There must be at least one personal servant between every two or three sisters; some public duty may be required from such servants at the discretion of the lady doctor.

12. No orders to be given by the sisters to any except their own personal servants and punkhawallahs except through the lady doctor.

13. Any complaints about the housekeeping to be made through the lady doctor.

14. Visitors may be invited to afternoon tea with the consent of the lady doctor. Ladies may occasionally be invited to other meals (with the consent of the lady doctor), at the expense of the person who invites them.

15. The rooms to be allotted at the discretion of the lady doctor, who may subsequently alter the arrangements, if she shall consider advisable.

(Sd.) R. T. GREER, Acting Chairman.

These ladies, be it remembered, have gone out to nurse plague patients and thus assist the municipality in a very sore strait. We should have thought that the powers that be would have tried their utmost to make things as easy as possible for people who have undertaken a very arduous task; but, on the other hand, these willing servants are hampered with the most absurd rules and saddled with expenses, not merely for luxuries, but for necessaries, to enable them to carry out their duties. We do not so much take exception to the restrictions on personal liberty and the rule that nurses should say where they are going, for this may be necessary for the purposes of organisation. But it is monstrous that they should have to pay for their own board and lodging, and still more for the items mentioned in Rule 10. A punkhawallah is a necessity in India, so is a washerman. Of course all expenses should be paid as well as a salary given. The municipality may well bear in mind the fate that overtook a sheriff in West Africa the other day. Three murderers had to be executed, and not being able to hire a professional slaughterer he had to hang the criminals himself. Soon afterwards he died from shock. If the municipality have to nurse plague patients themselves we should be sorry for the patients, but plague is no respecter of persons and might not spare even a vestryman.

THE MEAN ATMOSPHERIC PRESSURE AND TEMPERATURE OF THE BRITISH ISLANDS.

APART from its purely scientific interest, the subject of climatology has special attractions for the medical profession on account of its obvious bearing on many problems of health and disease. Most persons, also, who are free to choose their place of residence like to have some idea of the kind of weather which is likely to prevail in localities where they think of settling, for there is no doubt that all places are not alike in this respect and that the fact may be shown numerically by observations continued over a sufficiently long period. As mentioned in Dr. J. W. Moore's address on the Climatology of Dublin, published in THE LANCET of Aug. 27th, the temperature and rainfall of a given town or place are among the most important meteorological factors in the determination of its climate, hygienically considered; whilst, on the other hand, it is found in most parts of the world that the variations in atmospheric pressure as shown by the barometer have a definite relation to the phenomena of either wind or rain or both of them. In his well-known work "British Rainfall," Mr. G. J. Symons, F.R.S., has fully dealt with that component of our weather, and a valuable monograph on the mean atmospheric pressure and

temperature of the British Islands has this year been published in the *Journal of the Scottish Meteorological Society* by Mr. Alexander Buchan, LL.D., meteorological secretary of the society. The comprehensiveness of Mr. Buchan's work may be understood from the fact that it is based on the compilation and reduction of observations taken at 400 stations, 176 in England, 194 in Scotland, and 30 in Ireland. Fifteen years ago he published in the society's journal two papers on the same subject, based on the observations made during the twenty-four years ending with 1880, but since that time a large number of highly important stations have been added, including the two observatories on Ben Nevis, and a better inspection of stations has been brought about. These circumstances have suggested a revision of the work, and accordingly the present paper has been prepared from the observations made during the forty years from January, 1856, to December, 1895. It consist of twenty-three pages of tabular matter, twenty pages of explanatory text, and twenty-six coloured maps of the British Islands, showing the mean temperature and pressure for each month of the year graphically by isothermal lines marked with Fahrenheit and Centigrade degrees and isobaric lines marked with inches and millimetres. Mr. Buchan says of the south coast:—

It follows that where a winter climate is sought offering in the highest degree anywhere afforded by the British Islands the combined qualities of mildness and dryness, such a climate is to be found on the shores of the Channel from about Dover to Portland. To the west of Portland and round the coast to Clifton a higher temperature may be had, but the rainfall is greater, the climate damper, and raw weather of more frequent occurrence. On the other hand, in the eastern counties north of the Thames the climate is as dry, or rather dryer, but it is accompanied by a temperature from 2·0° to 3·0° colder. The south coast has another climatic advantage which may be noted. The prevailing west-south-westerly winds having crossed the Isle of Wight pass on in the direction of London. Now observations show that in passing from the Isle of Wight to London the mean temperature falls 3·0°, the lowering of the temperature being caused by the more rapid rate by which, as compared with the sea, the land is cooled by terrestrial radiation in winter. From this lowering of the temperature in proceeding inland it follows that haze and cloud are formed with greater frequency and of greater denseness as the winds successively advance on the colder districts. Hence the skies of the south coast may be expected to be clearer and brighter than in the valley of the Thames, a statement observation amply confirms."

SCARLET FEVER IN SWINE.

THE susceptibility of any of the lower—especially the domestic—animals to specific diseases proper to man, whether the communication be effected by ordinary contagion or by artificial inoculations, is fraught with scientific and practical interest, bearing as it does on the origin of local outbreaks and the spread of disease by milk, &c., and also as affording the only practicable means of fully investigating their etiology and prophylaxis by experiments *in corpore vili*. It has thus been fairly proved that cows are susceptible to scarlet fever, though in a modified form, dependent on histological and other differences, transmitting it again to man, in whom it resumes its normal characteristics. The disease of swine known as *rothlauf* in Germany, and as *rouget* in France is in England popularly called "pig's scarlatina" on account of the red erythematous eruption on the skin, but the absence of renal phenomena and the fact that lesions of the intestines are an essential feature would suggest a nearer relation to enteric fever. But Behle[1] reports a remarkable outbreak of what appears to have been the true human scarlet fever in swine. He states that in a district where *rothlauf* had never been known a severe epidemic of scarlet fever among the children was followed or accompanied by a very fatal disease among the pigs at the same farmhouses and cottages. The symptoms included erythema, angina, albuminuria, and those of uræmic poisoning, which (or the angina) were the usual causes of death, while in such as recovered desquamation of the skin was well marked. The lesions in the kidneys observed after death were very characteristic. A previously healthy pig having been inoculated with the blood of a child suffering from a severe attack died after a week's illness with symptoms and post-mortem appearances which were identical with those seen in the human subject and in the animals which had contracted the disease presumably from the children or from one another. If the facts be correctly reported the conclusion that swine are susceptible to true scarlet fever is irresistible.

[1] Centralblatt für Bakteriologie, Abtheilung i., Band xxi., Nos. 20 an 21.

THE AUTUMN CONGRESS OF THE SANITARY INSTITUTE.

THE Autumn Congress of the Sanitary Institute will be held at Birmingham from Sept. 27th to Oct. 1st inclusive. The reception, the public luncheon, and the opening of the Health Exhibition will take place on Sept. 27th, when the inaugural address will be delivered by Sir Joseph Fayrer, K.C.S.I., F.R.S. Sept. 28th, 29th, and 30th will be devoted to the business of the sections, but on the last-mentioned date several excursions are announced. Saturday, Oct. 1st, will be entirely devoted to excursions, including one to Stratford-on-Avon and Warwick Castle. Copies of the programme, tickets of membership, lodging lists, and all other information can b obtained from the honorary local secretaries, Dr. A. Bostock Hill, Mr. W. Bayley Marshall, M.Inst.C.E., and Mr. J. E. Wilcox, A.M.Inst.C.E. Communications should be addressed to the Council House, Birmingham.

"CONSCIENTIOUS BELIEF."

WHAT is "conscientious belief"? and what is the meaning of the law when it stipulates that magistrates shall be "satisfied" of its existence in an objecting parent? The metropolitan magistrates in conference have decided to hear such applicants without requiring them to be sworn. If *satisfied*, upon a verbal statement, that the applicant had a conscientious objection, the certificate, for which the applicant would be required to pay a fee of 1s., would be given. Such is the decision of the stipendiary magistrates and we may be pretty sure that the Justices of the Peace for the metropolis will not act very differently. But the fact remains that the Vaccination Act of 1898 is rather hard on the magistrates and throws upon them an undignified and an impossible duty. They are to "satisfy" themselves that the belief against vaccination is conscientious; but it is understood—Mr. Balfour said so in the House of Commons—that it was not intended that the magistrate should cross-examine the objecting parent of the "conscientiousness" of whose belief he was to "satisfy" himself. It is as difficult to ascertain the conscientiousness of a belief as its intellectual ground, but it might well puzzle even a philosopher like Mr. Balfour to do either when the mouth of the magistrate is supposed to be shut. One witness before a London magistrate has given in the course of the last fortnight the following reasons, among others, in support of his "conscientious" objection to have his two children vaccinated: "That vaccination was invented by an unqualified doctor's assistant named Jenner as a 'cure all, not as a specific remedy, for small-pox," and "that the statistics of small-pox in the county of London are systematically falsified by the way in which returns of small-pox are entered." Surely the magistrate's "conscience" might have some qualms in permitting such libels of Jenner and

of the authors of the statistics of small-pox of the County of London, much less in accepting such statements as signs or proofs of a conscientious belief. We are not intending to advise magistrates to raise difficulties in giving objectors the advantage of the Act; by doing so they would accept a responsibility which is not theirs and possibly put themselves into a still more undignified position than that in which the Act has placed them. But it does not follow that they should be speechless while the greatest medical authorities are being traduced and misrepresented, or that they should fail to show that they are noting the nature of the objection on which a "tremendous experiment" is being tried on helpless children which may have to be ended some day when its significance is realised by a community still largely protected by vaccination.

ALLEGED DEATH FROM WEARING A DYED STOCKING.

ON August 23rd the city coroner for Hull concluded an inquiry into the death of Rachel Binnington, who died on August 15th from, it was supposed, poisoning contracted from a dyed stocking worn on her left leg. Medical evidence showed that the deceased died from acute septicæmia. She had very extensive varicose veins. The city analyst said that the dye was composed of logwood and bichromate of potash. Dr. H. Robinson said he did not think the dye had anything to do with the death—he would rather put it down to some septic material from a living organism being introduced into the stocking. Considerable irritation has often been set up by dyes but in such cases arsenic has been the offending agent. Some instances were reported in the columns of THE LANCET, vol. i., 1886, page 432. Bichromate of potash certainly is poisonous but it would not set up septicæmia. We cannot but think, however, that all articles of wearing apparel, at any rate those that come in contact with the skin, should never be dyed with anything but vegetable or animal dyes and should be fixed with some non-poisonous salt like alum. An exception might be made in the case of using an iron salt to produce a black dye, but certainly aniline and arsenical colours should be avoided.

THE LATE DR. K. N. BAHADHURJI.

WE recently announced in our columns the too premature death of this very able Parsee medical man. On this side of the water Dr. Bahadhurji was perhaps best known as an ardent but temperate advocate for medical reform in India, but this was far from being the only subject in which he took an interest. During the plague epidemic he started a plague hospital in Bombay and it is to be feared that though he did not die from actual plague, yet the exertions which he made in attending his less fortunate brethren who were affected contributed to hasten his death. So much was his work appreciated by his fellows that in November, 1897, he was presented by the Parsee community with a service of plate. When the news of his death was made public the Corporation of Bombay adjourned their meeting out of respect to his memory and both Europeans and non-Europeans paid him tributes of respect. His funeral was almost of a public character and the office of the Empire of India Life Assurance Company, of which Dr. Bahadhurji was the chief medical officer, and the Ripon Musical Club were closed out of respect to the memory of the deceased. The Government paper and share markets were also closed on account of the useful services rendered by Dr. Bahadhurji to the Millowners' Association in 1891 in connexion with the Indian Factory Act. In this case the prophet was certainly not without honour in his own country and we can only offer our sympathies to all his friends and relations in their sorrow and add that as members of the medical profession we mourn the loss of one who had done, and if spared would have continued to do, such excellent work.

THE BRITISH ASSOCIATION.

BRISTOL is this year the scene of the annual meeting of the British Association for the Advancement of Science, and the proceedings were opened on the evening of Sept. 7th at the People's Palace. The recent disastrous conflagration at Colston Hall, where the meetings were to have been held, caused less inconvenience than might have been anticipated, owing to the energy of the local committee in making other arrangements at very short notice. The retiring President, Sir John Evans, introduced his successor, Sir William Crookes, whose presidential address will be found in another part of our present issue. The report of the council of the Association was read and adopted at a meeting of the general committee, held at the Museum, and presided over by Sir John Evans. Professor Rücker, the general treasurer, in presenting his report for 1897–98, mentioned that the association would give a donation of £120 to the Colston Hall Fund.

CONGENITAL FACIAL PARALYSIS.

AT the recent Congress of Physicians in Hamburg Dr. Nonne related the case of a child, two years of age, who had suffered since birth from the signs of right-sided facial paralysis. The labour was normal and no artificial aid was necessary. The deformity of the face was noticed as soon as the child cried. Syphilis and alcoholism in the parents could be excluded and no anomaly could be felt in the parotid region of the affected side. The child heard equally well on each side and no abnormality of the ears was apparent. There was no affection of any other cranial nerve, and mentally and physically the child seemed perfectly well but for the facial weakness. In the region of the forehead, eye, and cheek the electrical reactions seemed to be quite abolished; but in the quadratus menti and the orbicularis oris on the affected side a strong current evoked a slight contraction. Dr. Nonne was of opinion that the defect depended upon some lesion of the facial nucleus, possibly as Moebius and others have conjectured some congenital anomaly of the ganglion cells, and the prognosis as regards any improvement was distinctly bad.

THE DANGERS OF FOOD.

THE following is a selection of headings which appeared in the daily newspapers in the brief period of 5 days from August 25th to 30th inclusive: "Poisoned by Tinned Rabbit"; "Milk Adulteration in London"; "Dangers of Tinned Salmon: Fatal Result"; "Unsound Meat in Salford: Potted Meat Manufacturers Heavily Fined"; "Poisoned by Plums"; "Heavy Fine for Exposing Diseased Meat for Sale"; "Diseased Livers and Meat Extract"; and "A Job Lot of Condensed Milk." We need not dwell at any great length on the cases of poisoning by rabbit and salmon, which may be explained by the existence of some kind of ptomaines, those obscure basic bodies which for a reason not very clear develop in what is otherwise to all appearance food of a wholesome character. In regard, however, to tinned food the public cannot be too often warned that such food should be consumed immediately after the tin is opened and on no account should the contents of the tin be regarded as fit to eat if the ends are bulging outwards or convex. It is a pretty safe indication of the wholesomeness of the contents when both ends of the tin are partly collapsed inwards. The poisoning by plums was traced to the use of a zinc pan in the stewing of the fruit. When, however, we come to consider cases in which unwholesome, nay, putrid, meat and animal organs are found in the possession

of manufacturers of "table delicacies" we are face to face with a matter fraught with the gravest possible consequences. On the premises of certain dealers were found recently forty-four barrels of livers of various animals, perished, diseased, and rotten, and the slime into which they had liquefied by putrefaction was most offensive. These dealers are described on their business card as "manufacturers of preserved provisions, soups, and all kinds of table delicacies." Of course there was no intention to employ these livers in the manufacture of food for human (or other) consumption, but the association of "table delicacies" and putrid animal organs on the same premises is not a pleasant one. Apart altogether from sentiment the mischief done might be incalculable. It is well known that putrid meat infusions, and especially putrid animal organs, yield crystallisable bodies of a very deadly nature and comparable to the powerful vegetable alkaloids such as atropine, strychnine, and digitaline.

THE DINNER TO PROFESSOR VIRCHOW

As our readers are already aware the medical profession has decided to entertain Professor Virchow at dinner. The invitation has now been definitely accepted by the distinguished guest, and already there are 195 names on the stewards' list of persons desirous of attending to do honour to their great *confrère*. The dinner will be held, as previously announced, on Wednesday, Oct. 5th, in the Whitehall Rooms of the Hôtel Métropole, with Lord Lister in the chair. There will be accommodation found for about 250 guests, a fact of which those who wish to be present and have not already applied for tickets are reminded. All communications should be made to Mr. Andrew Clark, 71, Harley-street, W., who has undertaken the duties of honorary secretary of the dinner. The inclusive cost of a ticket is £1 5*s*.

ABSCESS OF INTERNAL CAPSULE.

IN the Biological Section of the Congress of Physicians at Hamburg in June last Dr. Sänger related a case possessing both medical and surgical interest. The patient was a man, aged twenty-eight years, who had previously been in hospital on account of alcoholism and delirium, but who, in May of the present year, sought admission on account of headache, giddiness, and sickness. In May of 1897 he had had double otitis media, and in October his right ear had been operated upon. In December he had had severe pain in the frontal region which had persisted both night and day for some time, but had been relieved by antipyrin and local measures to the ear. On May 12th on admission he was rather stupid with weakness all down the left side, blunting of sensibility, hemianopia, and tenderness on percussion over the right frontal and temporal regions. There was unsteadiness in walking and even in standing and it was evident that there was a lesion of the hinder part of the internal capsule. Trephining was done, but in spite of many punctures no abscess was found. The patient died seven days later and at the necropsy an old abscess was found in the locality indicated. It had so thick and firm a wall that the exploring needle had apparently glided off and failed to penetrate it—a possibility in such cases well worthy the attention of surgeons.

BY Royal Warrant dated India Office, August 26th, 1898, it is announced that Her Majesty has deemed it expedient to alter the ranks of the officers of the Indian Medical Service. The same military titles as those conferred on the officers of the Royal Army Medical Corps are announced for the officers of the Indian Medical Service.

A MOVEMENT has been set on foot to place a memorial window to Principal Caird's memory in the Bute Hall of the University of Glasgow. We commend the idea to the notice of Glasgow graduates, who should send their contributions to Mr. Archibald Craig, of 156, St. Vincent-street, Glasgow.

THE Lord-Lieutenant of Ireland has appointed Mr. John Lentaigne, F.R.C.S.I., to be surgeon to the household in the room of Mr. Thomas Nedley, M.D. Aberd., F.R.C.S. Irel., resigned.

PROFESSOR CORFIELD has, we regret to learn, sustained a fracture of one of the metacarpal bones of the left hand by a blow from a golf-ball.

DR. KESER, Physician to the French Hospital and Dispensary, has been made a Knight of the Legion of Honour.

TYPHOID FEVER IN BELFAST.

THE main discussion at the meeting of the city corporation of Belfast on Sept. 1st was the present increased prevalence of typhoid fever. The report of the medical officer of health brought out the serious fact that between July 17th and August 20th 1052 cases of zymotic disease had been notified and of these 784 were typhoid fever. Since the notification of the Infectious Diseases Act came into force the number of cases of typhoid fever notified has been as follows:—1897: March, 215; April, 289; May, 517; June, 262; July, 179; August, 304; September, 379; October, 354; November, 351; and December, 273. 1898: January, 288; February, 222; March, 345; April, 469; May, 254; June, 327; July, 226; and August, 784 (five weeks). These figures show that, as THE LANCET Special Sanitary Commissioner in his reports on Belfast has pointed out, typhoid fever in that city is really endemic and that the present state of affairs is not an epidemic but simply an exacerbation of the normal condition. It is interesting to note that while the number of cases of typhoid fever has more than doubled (comparing August, 1898, with the same month in 1897), the number of deaths from all zymotic diseases is less by 25 per cent. In the face of the present deplorable state of affairs we are glad to say that the Public Health Committee have decided:—1. To appoint Dr. Lorrain Smith to examine bacteriologically all samples that the medical officer of health considers necessary for the purpose of investigating the cause of the fever. 2. They have decided to establish refuse destructors which should have been in use many years ago. 3. They recommend that proceedings be taken against each individual owner of houses which are not supplied with water-closets and have not back passages by which offensive material can be removed, and also to compel the provision of water-closets in place of privies. It is a most extraordinary circumstance that the corporation ever should have passed the plans of houses without back passages. 4. Each member of the corporation is to be supplied with a copy of a return of the piggeries kept in the city of Belfast and the number of pigs kept and where they are or are not kept in accordance with the by-laws. Further, the chairman of the Town Improvement Committee announced that after Sept. 5th building inspectors would test all drains of houses before they were passed. It appears that hundreds of new houses, as stated by members of the corporation, were passed without the ordinary test. Councillor O'Neill, M.D. R.U.I., said that he did not want to make out things blacker than they were—they were quite black enough in the city—but he considered it a matter of urgency that there should be an investigation of the drains of all the houses built within the past five years. "Typhoid fever was now so prevalent because," he said, "they had laid the means of breeding it. They had allowed matter containing the germs of the disease to be sown broadcast and now they attributed to a visitation of Providence what was really due to a want of visitation by the sanitary inspectors." We give the Public Health Committee every credit for the exertions they are now putting forth, but they

must remember that they have not merely to stamp out the present epidemic of typhoid fever, but they have to attack a much more difficult and more serious problem, and that is the fact that the disease is endemic and that this has been caused by a deplorable neglect of the most obvious sanitary laws. Alderman Graham, M.D.R.U.I. (chairman of the Public Health Committee), who is taking the utmost pains in the present most difficult position, deplored that the corporation had done very little for them except when there was an epidemic; he hoped they would now give them a free hand over everything they asked.

We are sure that Alderman Graham will have the unanimous support of all the citizens in any efforts he may make to have the reproach removed from Belfast that its death-rate from typhoid fever — a preventable disease—is the highest in the three kingdoms. Some people have raised suspicions as to the water being the cause of the epidemic. We quite admit that the water supplied to the city is not by any means a first-class one nor are the catchment areas beyond the suspicion of sewage contamination; but it is a curious fact that while the water comes from two different areas, no one of these supplies seems to have infected those using it more than the other; the typhoid fever is all over the city; but, what is very remarkable, the inhabitants of the gaol and the asylum (although using town water) have escaped the disease. But even if the water could be proved not to be good we know that in a few years the new supply brought from the Mourne Mountains will be ready. The Water Commissioners are pushing on with this new scheme; it behoves the corporation to do their duty and to see that the defects of the most obvious sanitary laws which they allowed to occur are at last corrected. Councillor O'Connell, M.D.R.U.I., a member of the Health Committee, said in the discussion that as a matter of fact the schemes at present in operation and contemplated would involve an expenditure of £150,000 to the ratepayers and private property owners, and he gave the following quotation from the report of THE LANCET Special Commissioner, who wrote a series of articles last year on the Sanitary State of Belfast—"Though there are all sorts of side issues and contributory causes the high death-rate and the exceptionally insanitary condition of Belfast are in the main due to the condition of the house property and thus it is that typhoid fever is endemic at Belfast.

OPENING OF THE MEDICAL SCHOOLS.

WINTER SESSION, 1898–99.

St. Bartholomew's Hospital.—The session will open on Oct. 3rd, and the usual dinner of old students will be held in the great hall of the hospital on Oct. 4th.

Charing-cross Hospital.—The session will commence on Oct. 3rd, when Professor Virchow, Foreign Member of the Royal Society, Director of the Berlin Pathological Institute, and some time Rector Magnificus of the University of Berlin, will deliver the second Huxley Lecture on Recent Advances in Science and their bearing on Medicine and Surgery. The chair will be taken at 4 P.M. by Lord Lister, President of the Royal Society.

Guy's Hospital.—The session will begin on Oct. 3rd.

St. George's Hospital.—The session will commence on Oct. 1st, when an introductory address will be delivered by Mr. George R. Turner, surgeon to the hospital, at 4 P.M.

King's College Hospital.—The session will begin on Oct. 3rd.

The London Hospital.—The session will commence on Oct. 1st. The annual dinner will be held in the College Library on Oct. 3rd, Mr. Mansell Moullin in the chair.

St. Mary's Hospital.—The session will begin on Oct. 3rd with an introductory address at 3 P.M. by Dr. Caley. The annual dinner will be held in the evening at the King's Hall, Holborn Restaurant, Mr. J. N. Moore, J.P., in the chair.

The Middlesex Hospital.—The session will open on Oct. 3rd, at 3 P.M. Dr. Arthur F. Voelcker will deliver an introductory address, after which the prizes gained during the previous year will be distributed. The annual dinner of the past and present students and their friends will take place the same evening at the Café Royal, Regent-street, at 7 o'clock, the Right Hon. Sir Ralph Thompson, K.C.B., in the chair.

St. Thomas's Hospital.—The session will commence on Oct. 3rd, when the prizes will be distributed at 3 P.M. by the Right Rev. the Lord Bishop of Rochester in the Governors' Hall. The old students' annual dinner will take place the same evening in the Whitehall Rooms of the Hôtel Métropole at 6.30 for 7 P.M., Dr. Leonard W. Sedgwick in the chair.

University College Hospital.—The session will be opened on Oct. 3rd at 4 P.M., when an introductory lecture will be delivered by Mr. Sidney Spokes, dental surgeon to the hospital. The annual dinner of the old and present students will take place on Oct. 3rd at the Hotel Cecil at 6.30 P.M., Professor F. T. Roberts, M.D. Lond., in the chair.

Westminster Hospital.—The session will begin on Oct. 3rd.

London School of Medicine for Women (Royal Free Hospital).—The session will open on Oct. 3rd. The introductory address will be delivered by Dr. J. Walter Carr, senior physician to out-patients, Royal Free Hospital, on Oct. 4th, at 8 P.M., when the distribution of prizes by Mrs. Charles Burt will take place.

The Dental Hospital of London, Leicester-square.—The session will commence on Oct. 3rd.

National Dental Hospital and College, Great Portland-street, W.—The session will begin on Oct. 3rd.

PROVINCIAL.

Mason University College, Birmingham.—The session will commence on Oct. 1st. Professor Michael Foster, M.A., M.D., F.R.S., will deliver an address.

University College, Bristol.—The session will commence in October.

University College of South Wales and Monmouthshire, Cardiff.—The session will commence on Oct. 3rd, when the opening address will be delivered by Dr. Robert Saundby.

The University of Durham College of Medicine, Newcastle-upon-Tyne. — The session will be opened on Oct. 1st, when the scholarships and prizes will be presented by Sir David Dale, Bart., D.C.L., J.P., D.L.

The Yorkshire College, Leeds.—The session will open on Oct. 3rd, when an address will be delivered by Dr. Cullingworth.

University College, Liverpool.—The session will commence on Oct. 1st.

Owens College, Manchester.—The session will commence on Oct. 3rd.

University College, Sheffield.—The session will commence on Oct. 3rd, when the introductory address will be delivered by Dr. Wm. Dyson, B.A., Vice-President of the College, Professor of Medicine, and Senior Physician, Sheffield Royal Infirmary.

SCOTLAND.

University of Aberdeen.—The session will commence on Oct. 19th.

Anderson's College Medical School, Glasgow.—The session will be opened on Oct. 20th.

University of St. Andrews.—The classes will be opened for the session on Oct. 12th.

University College of Dundee.—The session will open on Oct. 12th.

University of Edinburgh.—The session will open on Oct. 18th.

University of Glasgow. — The session will be opened on Oct. 20th.

University of Glasgow (Queen Margaret College). — The session will begin on Oct. 20th.

St. Mungo's College and Glasgow Royal Infirmary.—The session will be opened with an Address to Medical Students on Oct. 20th.

MEDICAL REFEREES UNDER THE WORKMEN'S COMPENSATION ACT.

THE Secretary of State for the Home Department has made the following further appointments of medical referees under the Workmen's Compensation Act, 1897, for Scotland:—

Sheriffdom of Lanarkshire.—Dr. Hector Cameron, Dr. T. K. Dalziel, Dr. G. T. Beatson, Dr. Duncan Macartney, Dr. James C. Renton, Mr. H. E. Clark, Dr. David Newman, and Dr. W. J. Fleming, all of Glasgow; Dr. James Barras, Govan; and Dr. Hugh Arthur, Airdrie.

Sheriffdom of Argyll.—Dr. Dove M'Calman, Oban; Mr. James Stewart, Inverary; Dr. John Ritchie, Dunoon; and Dr. John Cunningham, Campbeltown.

Sheriffdom of Perth.—Dr. Robert Stirling, Perth; Dr. Charles Luman,

Blairgowrie; Dr. John Mackay, Aberfeldy; Dr. Alexander Thom, Crieff; and Dr. Andrew C. Buist, Dunblane.

Sheriffdom of the Lothians and Peebles.—Dr. John Shaw M'Laren, Dr. David Wallace, Dr. J. C. Dunlop, and Dr. Alexander Miles, all of Edinburgh; Dr. Alexander Ballantyne, Bskbank, Midlothian; Dr. Thomas Malcolm Murray Lyon, Mid Calder; Dr. John George Wallace-James, Haddington; and Dr. John Connel, Peebles.

Sheriffdom of Stirling, Dumbarton, and Clackmannan.—Dr. D. McFadyen, Stirling; Dr. Alexander D. Fraser and Dr. Robert D. Clarkson, Falkirk; Dr. W. A. McLachlan, Dumbarton; Dr. P. Napier Grant, Lenzie; Dr. Robert Wilson, Alloa; and Dr. John Barlow and Dr. Samuel Macfarlane Sloan, Glasgow.

Sheriffdom of Roxburgh, Berwick, and Selkirk.—Dr. William Jeffrey, Jedburgh; Dr. W. Turnbull Barrie, Hawick; Dr. John McWatt, Duns; and Dr. Charles Reid, Selkirk.

Sheriffdom of Aberdeen, Kincardine, and Banff.—Dr. Alexander Ogston and Dr. J. C. Ogilvie Will, Aberdeen; Dr. John Barclay, Banff; and Dr. James Taylor, Keith.

Sheriffdom of Ross, Cromarty, and Sutherland.—Dr. William Bruce, Dingwall; Mr. Murdoch Mackenzie, Stornoway; and Dr. James Bertie Simpson, Golspie.

Sheriffdom of Dumfries and Galloway.—Dr. Thomas Ferguson, Dumfries; Dr. W. S. Spence Reid, Kirkcudbright; and Dr. D. Duke Monro, Stranraer.

Sheriffdom of Forfar.—Dr. David MacEwan and Dr. Patrick R. Murison, Dundee; Dr. A. S. McLagan Wedderburn, Forfar; and Dr. James Alexander Dewar, Arbroath.

Sheriffdom of Caithness, Orkney, and Shetland.—Dr. Samuel Elliot, Wick; Dr. Alexander Asher, Thurso; Mr. Benjamin Bell, Kirkwall; and Dr. John F. Robertson, Lerwick.

Sheriffdom of Renfrew and Bute.—Dr. J. N. Marshall, Rothesay; Dr. Donald Fraser and Dr. Thomas Graham, Paisley; Dr. James Whiteford and Dr. Thomas Philip, Greenock; Mr. R. H. Parry and Dr. A. E. Maylard, Glasgow; and Dr. Robert Allan, Ardrossan.

Sheriffdom of Ayr.—Dr. George McKerrow and Dr. James Ross Watt, Ayr; Dr. William Macfarlane, Maybole; Dr. William McAlister and Dr. William Frew, Kilmarnock; and Dr. Robert Allan, Ardrossan.

Sheriffdom of Fife and Kinross.—Dr. C. E. Douglas, Cupar; Mr. Robert Balfour Graham, Leven; Dr. J. Sutherland Mackay and Dr. H. W. Laing, Kirkcaldy; Dr. C. A. Sturrock, Dunfermline; and Mr. James Mungle, Kinross.

Sheriffdom of Inverness, Elgin, and Nairn.—Dr. John Munro Moir, Inverness; Dr. Alexander Cameron Miller, Fort William; Dr. John Dewar, Portree, Skye; Dr. Francis William Grant, Elgin; and Dr. Hugh William Mann, Larkfield, Nairn.

METROPOLITAN MEDICAL SCHOOLS.

PRIZES FOR 1897–98.

THE following is a list of prizes, &c., awarded for the session 1897–98:—

St. Bartholomew's Hospital.—Lawrence Scholarship and Gold Medal: T. J. Horder. Brackenbury Medical Scholarship: C. Riviere. Brackenbury Surgical Scholarship: H. Munday. Matthews Duncan Medal and Prize: J. L. Maxwell. Senior Scholarship in Anatomy, Physiology, and Chemistry: R. C. Elmslie. Open scholarships in Science, Chemistry, and Physics: C. E. West. Biology and Physiology: W. M. Fletcher; junior, H. R. Kidner and E. C. Williams, equal. Preliminary Scientific Exhibition: E. G. Pringle. Jeaffreson Exhibition: L. R. Tosswill. Kirkes Scholarship and Gold Medal: R. Hatfield. Bentley Prize (surgical) not awarded. Hichens Prize: F. Gröne. Wix Prize: W. E. L. Davies. Harvey Prize: (1) S. G. Mostyn; (2) R. C. Elmslie, (3) F. Gröne, and (4) E. Ladell. Sir George Burrows Prize: No award. Skynner Prize: No award. Practical Anatomy (senior): Foster Prize: R. C. Elmslie and H. Love (equal), (3) F. N. White, (4) R. T. Worthington, (5) A. E. Thomas, (6) W. R. Read, (7) E. W. J. Ladell, (8) E. L. Martin, and (9) H. J. Slade. Practical Anatomy (junior)—Treasurer's Prize: (1) T. C. Neville, (2) E. B. Smith, (3) T. P. Baldwin, (4) J. Corbin, (5) N. E. Waterfield, (6) E. C. Williams (7) T. R. Couldrey, and (8) A. S. Petrie. Shuter Scholarship: F. C. Shrubsall. Junior Scholarships: (1) E. C. Williams and (2) E. B. Smith. Junior Scholarship in Chemistry and Histology (1897): (1) R. C. Elmslie and (2) F. N. White.

Guy's Hospital.—Open Scholarships in Arts: Percy Reginald Bolus, Bancroft School, Woodford Wells, £100; Gayton Warwick Smith, Liverpool College, Certificate. Dental Students: Percival Pasley Cole, Weymouth College, £30. Open Scholarship in Science: Albert Ernest Hardman Pakes, Guy's Hospital, £150. Scholarship for University Students: Aubrey Hugh Davies, Caius College, Cambridge, £50; Reginald Cuthbert Mullins, Keble College, Oxford, Certificate; James Alison Glover, St. John's College, Cambridge, Certificate. Second Year's Prize: (1897) James Alfred Butler, £25. Junior Proficiency Prizes: Louis Edward Stamm, £20; William Henry Bowen, Claude Tessier, equal, £12 10*s.* each; Henry Crewe Keates, Certificate; George Thomas Collins, Certificate. The Michael Harris Prize for Anatomy: Claude Tessier, prize £10. William Henry Bowen, Certificate. The Sands Cox Scholarship in Physiology: Louis Edward Stamm, £15; Myer Coplans, Certificate. The Hilton Prize for Dissection: (1897) Frederick Goulburn Gibson, prize £5. The Arthur Durham Prizes for Dissections—First year's students: Richard Willan, prize £5; Carrick Hey Robertson, Certificate; William Edward James Tuohy, Certificate. Second year's Students: Hugh Davies-Colley, Claude Tessier, equal, £7 10*s.* each; Herbert William Brown, Certificate; Henry Francis Hatfield, Louis Edward Stamm, equal, Certificates. Dental Prizes—Second Year's Students: (1897) Hubert Arnold George Butler, prize, £15; Alfred William Walker, certificate; Victor George Smith, certificate; Bertram James Sumerling, certificate. First Year's Students: (1897) Percival Sidney Campkin, prize, £10; Harry Hudson Evans, certificate; (1898) Frank Warlow, prize, £10; Hugh Titford Campkin, certificate. Practical Dentistry Prize: (1897) Henry Albert Ellis Canning, prize, £10; Alfred William Walker, certificate; (1898) Percival Sidney Campkin, prize, £10; John Stewart Farnfield and Stephen Holloway Olver, equal certificates. Fourth Year's Prizes: (1897) Philip Turner, prize, £25; Harold Wilson Bruce and William Tayler Milton, equal, £5 each; Charles Leopold Granville Chapman and George Ernest Richmond, equal certificates. The Richard Bredin Prize for Clinical Study: (1897) Robert Pugh Rowlands, £25; (1898) William Tayler Milton, £25. The Golding-Bird Gold Medal and Scholarship for Sanitary Science: Robert Wynne Charles Pierce, £20. The Treasurer's Gold Medal for Clinical Medicine: (1897) Robert Pugh Rowlands; (1898) William Tayler Milton. The Treasurer's Gold Medal for Clinical Surgery: (1897) Robert Howard; (1898) Frederick Edward Walker and Philip Turner.

King's College, London.—Faculty of Medicine, 1897-98.—Recommended for the Associateship: R. M. Cowie, H. Dingle, L. H. Fuller, F. H. Jacob, J. E. London, and R. P. Williams. Scholarships and Exhibitions.—Senior Scholarship: C. A. Sprawson and A. Brown (equal). Second Year Scholarship: A. Edmunds. Junior Scholarship: E. A. Bell. Warneford Scholarship (resident): J. C. Briscoe. Warneford Scholarship (Class I.): H. B. Day and A. A. Myers. Sambrooke Scholarship: M. R. C. MacWatters and J. A. Drake (equal). Rabbeth Scholarship: A. A. Myers and H. B. Day (equal). Special Prizes.—Leathes: W. H. Lowman; Warneford (first): W. H. Lowman; Warneford (second): J. M. Twentyman; Barry (Divinity): A. A. Myers; Tanner: C. A. Sprawson. Todd (Medical Clinical): C. A. Sprawson. General Prizes and Certificates—Winter session, 1897-98, summer session 1898.—Divinity: E. A. Bell; Anatomy: W. L. Stuart; Materia Medica: W. W. Campbell; Hygiene: C. A. Sprawson; Pathological Anatomy: C. A. Sprawson; Obstetric Medicine: W. H. Lowman; Forensic Medicine: W. H. Lowman; Clinical Surgery: R. R. Mowll; Clinical Surgery (Professor Rose's prize): I. M. Jefferiss.

University College, London.—Winter Session, 1897–98.—Entrance Exhibitions.—L. A. E. de Zilwa (£137 11*s.*); C. S. Parker and R. E. Lloyd (£57 15*s.* each). Atchison Scholarship (£55 per annum for two years): J. E. Simpson. Bruce Medal: J. E. Simpson. Physiology—Senior Class: Gold medal, R. E. Lloyd; silver medal, L. A. E. de Zilwa; certificates, (3*) L. G. Hopkins and (4*) W. S. Rooke. Second Class: F. J. A. Mayes, C. S. Parker, and S. H. Bown. Third Class: C. A. Hewavitarna, G. W. Curtis, and F. J. Lawson. Junior Class: Silver Medal, J. E. Stratton; certificate, (2*) R. H. Aders. Second Class: G. F. I. Harkness, C. J. Loosely, and H. A. Lyth. Third Class: J. B. Burt, A. F. Horn, and G. B. McKean. Anatomy—Senior Class: Gold Medal, C. S. Parker; Silver Medal, S. H. Bown. Second Class: S. Bree and E. S. Littlejohn. Third Class: W. T. Crawford, L. A. E. de Zilwa, and R. E. Lloyd. Junior Class: Silver Medal, H. A. Lyth; certificate, (2*) A. F. Horn. Second Class: G. B. McKean and J. E. Stratton. Third Class: J. A. Smyth, J. B. Burt, and G. F. I. Harkness. Medicine: Gold Medal, W. L. Griffiths; first silver, J. E. Phillips; second silver, Ivor L. Tuckett; certificates, (4*) A. Ricketts and J. E. Simpson (equal), (6*) H. M. Hart-Smith. Surgery: Gold Medal, J. E. Simpson. Second Class: W. L. Griffiths, H. M. Hart-Smith, and Ivor L. Tuckett. Third Class: J. E. Phillips. Pathology—Morbid Histology and Bacteriology—Tuke Silver Medal: G. E. Charles. Tuke Bronze Medal: A. R. G. Pocock. Third Class: A. R. Spencer. Practical Surgery—Erichsen Prize: W. L.

Griffiths. Certificates: (2*) D. Davies and H. M. Hart-Smith, equal; (4*) J. E. Simpson. Second Class: Ivor L. Tuckett. Clinical Medicine—Senior Class—Fellowes Gold Medal: H. M. Hart-Smith. Fellowes Silver Medal: Ivor L. Tuckett. Certificates: (3*) W. L. Griffiths, J. E. Phillips, A. Ricketts, and J. E. Simpson (equal). Second Class: D. S. Baker. Junior Class—Fellowes Silver Medal: P. M. Heath. Certificates: (2*) W. F. Addey, (3*) A. R. G. Pocock, B. E. Reynolds, and W. L. Steele (equal). Second Class: W. Bastian, T. Evans, A. L. Murison, and E. W. D. Swift. Third Class: H. S. Capper and A. R. Spencer. Clinical Dental Surgery—Silver Medal: J. E. Simpson. Certificates: (2*) W. L. Griffiths, (3*) J. E. Phillips, and (4*) Ivor L. Tuckett. Summer Session, 1897-98—Histology and Practical Histology—Second Class: J. B. Burt, G. F. I. Harkness, C. A. Hêwavitarna, H. A. Lyth, and J. E. Stratton. Third Class: R. H. Aders, C. H. Berry, and G. A. Bosson. Chemistry—Practical Class (Int. Med.)—Prize: W. T. Crawford. Second Class: S. M. Banham, G. E. Waugh, and C. S. Parker. Chemistry and Chemical Physics (Conjoint Board)—Prize: V. K. Sadler. Third Class: E. C. E. Barnes and W. H. Neil. Practical Chemistry (Conjoint Board)—Prize: V. K. Sadler. Certificate: (2*) W. H. Neil. Third Class: O. Marshall. Materia Medica and Therapeutics—Gold medal: L. A. E. de Zilwa. Certificate: (2*) C. S. Parker. Second Class: S. H. Bown. Third Class: D. Roberts. Midwifery—Junior Class—Silver Medal: P. M. Heath. Certificate: (2*) W. E. Peck. Second Class: C. J. I. Krumbholz and E. W. D. Swift. Third Class: A. R. G. Pocock. Medical Jurisprudence.—Gold Medal: A. R. G. Pocock. Pathology—Filliter exhibition of £30: H. S. Capper. Silver Medal: E. W. D. Swift. Second Class: A. R. G. Pocock and A. R. Spencer. Third Class: M. T. Male. Ophthalmic Medicine and Surgery—Third Class: J. E. Simpson. Clinical Medicine—Junior Class: Fellowes Silver Medal—N. F. Stallard. Certificates: (2*) M. T. Male and C. Visger (equal). Second Class: P. T. H. Steadman, H. Stuart, and C. W. Wirgman.

* Obtained the number of marks qualifying for a prize.

St. George's Hospital.—Brackenbury Prize in Medicine: B. Percival. Brackenbury Prize in Surgery: H. S. Barwell. Webb Prize in Bacteriology: H. Spitta. Treasurer's Prize: R. B. Ainsworth. Sir Benjamin Brodie's Clinical Prize in Surgery: R. B. Ainsworth. The Henry Charles Johnson Prize in Anatomy: J. C. S. Rashleigh. Honorary Certificates in Anatomy: Keppel H. Reed, S. H. Nathan, Adrian Caddy, and C. M. N. May. Sir Charles Clarke's Prize: H. G. Drake-Brockman.

St. Thomas's Hospital.—Winter Session, 1897-98.—Entrance Science Scholarships: W. H. Harwood-Yarred, first scholarship, £150, and certificate of honour; and F. H. Whitehead, scholarship, £60, and certificate of honour. University Scholarship: F. C. Eve, scholarship, £50, and certificate of honour. First Year's Students: W. H. Harwood-Yarred, the William Tite Scholarship, £27 10*s.*, and certificate of honour; J. E. Adams, college prize, £20, and certificate of honour; O. Mills, college prize, £10, and certificate of honour; and C. U. Ind, certificate of honour. Second Year's Students: C. N. Sears, the Peacock Scholarship, £38 10*s.*, and certificate of honour; A. F. Miskin, college prize, £20, and certificate of honour; and A. B. Lindsey, college prize, £10, and certificate of honour. Practical Medicine: E. F. Buzzard, the Mead Medal, founded by Mr. and Mrs. Newman Smith. Surgery and Surgical Anatomy: S. O. Bingham, the Cheselden Medal, founded by the late Mr. George Vaughan; S. A. Lucas, certificate of honour; and H. D. Singer, certificate of honour. Pathology and Morbid Anatomy: A. W. Sikes, the Bristowe Medal. Grainger Testimonial Prize: R. Beer, prize, £15; E. M. Corner, certificate of honour. For Reports of Surgical Cases: C. W. Pilcher, the Solly Medal and prize. For General Proficiency and Good Conduct: H. E. Hewitt, the treasurer's gold medal.

St. Mary's Hospital.—1897—Entrance Scholarship in Natural Science of £144: M. F. Kelly. 1897—Entrance Scholarship in Natural Science of £78 15*s.*: J. B. Albury. 1897—Entrance Scholarship in Natural Science of £78 15*s.*: D. E. Finlay. 1897—Entrance Scholarship in Natural Science of £52 10*s.*: J. H. Wells. 1897—University Scholarship of £57 15*s.*: C. Killick, B.A. 1897—University Exhibition of £39 7*s.* 6*d.*: A. Whitmore, B.A. 1897—University Exhibition of £39 7*s.* 6*d.*: E. R. Clarke, B.A. 1897—Meadows Memorial Prize: J. B. Page. 1898—Kerslake Scholarship of value of £25: C. W. Buckley. Summer session, 1897.—Third year—Practical Surgery: J. A. H. Brincker, B.A., and E. R. Hunt, B.A. Second year—Midwifery: J. B. Page, F. C. Lewis, and A. F. MacCallan, B.A. Medical Jurisprudence: T. W. Bates, M.A., A. E. Horn, J. A. H. Brincker, B.A., and R. C. Leaning. First year—Materia Medica: W. H. Willcox, B.Sc., E. W. Holyoak, and V. C. Bensley. Practical Chemistry: H. T. Doble, H. M. Major, and F. C. Lambert. Chemistry: H. T. Doble, G. J. Evans, and R. Butterworth. Prizes in Ophthalmology of £10 10*s.*: A. S. Gardiner and G. S. Keeling. Prizes in Dermatology of £5 5*s.*: J. B. Page and V. C. Bensley. Prize in Psychological Medicine of £3 3*s.*: T. W. Bates, M.A. Clinical Surgery Prize, 1897—98: J. A. H. Brincker, B.A., and E. R. Hunt, B.A. Clinical Medicine Prize, 1897—98: J. A. H. Brincker, B.A., and J. B. Page. Clinical Medicine Prize, 1898-99: W. H. Willcox, B.Sc., and W. B. Watson. Winter Session, 1897-98.—Third year.—Medicine: C. W. Buckley and F. S. Dawe, B.Sc. Surgery: A. G. Wilson, B.A., and C. W. Buckley. Practical Surgery: F. W. Sumner, B.A., and C. W. Buckley. Pathology: H. Agate and J. A. H. Brincker, B.A. Second year—Anatomy: T. M. Harris, B.A., D. W. Bishop, and C. C. C. Shaw. Physiology: C. C. C. Shaw. Histology: W. J. Morrish, D. W. Bishop, and C. C. C. Shaw. First year—Anatomy: M. F. Kelly, V. Nesfield, and D. E. Finlay. Physiology: M. F. Kelly and H. E. Corbin, B.Sc. Biology: N. Low, G. Y. Evans, O. Jevers, and G. E. Wood. Special Prize, 1897.—In Anatomy and Physiology (including Histology): W. H. Willcox, B.Sc.; Prosectors, D. W. Bishop and J. Gay-French.

The London Hospital.—Session, 1897-98.—Price Scholarship in Science (£120): J. Jones. Price Scholarship in Anatomy and Physiology (£60): R. Warren. Entrance Science Scholarships—£60 Scholarship, R. V. Dolbey; £35 Scholarship, M. T. Williams. Buxton Scholarships.—Arts: £30 Scholarship, M. Culpin; £20 Scholarship, G. Rodolph. Clinical Medicine: £20 Scholarship, A. F. Tredgold. Clinical Surgery: £20 Scholarship (equal, scholarship divided), R. Howard and G. R. Slade. Clinical Obstetrics: £20 scholarship, J. Sherren. Duckworth Nelson Prize: biennial, £10, awarded 1897. Andrew Clark Prize: biennial, £26, R. C. B Wall. Letheby Prizes: Senior, £20 (equal, scholarship divided), H. Balean and F. Challans; junior, £10, M. Culpin. Sutton Scholarship: £20 scholarship, E. W. A. Walker; extra prize, £5 5*s.*, A. F. Tredgold, *proxime accessit*. Anatomy and Physiology: £25 scholarship (equal, scholarship divided), A. L. Matthews and A. B. Soltau. Anatomy and Biology: £20 scholarship, H. B. Willoughby Smith. Minor Surgery Prizes: £15 prize, H. L. Burgess; £5 prizes, H. C. Clitherow, J. S. Elliot, R. Jeremy, C. C. T. Magee, and G. Sowden; £3 6*s.* 8*d.* prizes, E. W. Grogono, W. M. McDowall, and C. L. Traylen. Practical Anatomy: £6 prize, H. E. Ridewood; £4 prize, E. F. Fisher. Anderson Prizes: £2, F. P. T. Hilliard and W. B. Taylor; £1, E. V. Aylen, A. C. Goodwin and J. H. Philbrick.

Westminster Hospital.—Entrance Scholarships: G. L. Bunting (£60), B. N. Tebbs, B.A. (£40), P. J. Marett (£40), and W. C. Nimmo (£30). Treasurer's Prize, for first winter subjects (value 10 guineas): E. C. Whitehead (prize). President's Prize for second-year subjects (value 20 guineas): prize, W. Payne and E. R. Carling (equal). Bird Prize and Medal (value £14): H. C. Barlow and H. H. Cheesman (equal). Class Prize, Medicine: E. C. Lambert (prize). Fish Prize (value £20): H. T. Barron (prize). Clinical Medicine Prize (value 8 guineas): H. C. Barlow (prize). Practical Chemistry: E. R. Carling (prize). Physics: E. R. Carling (prize). Histology: W. Payne (prize). Practical Pharmacy: W. Payne (prize). Midwifery: E. B. Sherlock (prize). Forensic Medicine and Toxicology: E. B. Sherlock (prize). Pharmacology and Therapeutics: F. W. W. Dawson (prize).

Charing-cross Hospital.—Summer Session, 1897, and Winter Session, 1897-98.—Livingstone Scholar: S. A. Boyd. Huxley Scholar: W. J. O'Brien. Epsom Scholar: E. J. C. Jermain. University Scholar: W. G. Rogers. Llewellyn Prize of £25: P. L. Daniel. Governors' Clinical Gold Medal: P. L. Daniel. Huxley Medal with Prize of £10: E. F. Ackery. Golding Prize—Certificate and £10: S. A. Boyd. Pereira Prize—Certificate and £5: E. L. Lilley; Anatomy (senior)—prize: E. F. Ackery; Anatomy (junior)—prize: E. Bayley; Physiology (senior)—prize: E. F. Ackery; Physiology (junior)—prize: W. B. Blandy; prize, E. Bayley (equal); Biology—prize: C. L. Lakin; Chemistry—prize: S. A. Boyd; Practical Medicine—prize: B. A. Nicol; Minor Surgery—prize: J. P. Candler; prize, W. T. Mullings (equal); Medicine (senior)—prize: P. L.

Daniel; Medicine (junior)—prize: B. A. Nicol; prize, E. H. Bonney (equal); Surgery (senior)—prize: P. L. Daniel; Surgery (junior)—prize: B. A. Nicol; Psychological Medicine—prize: W. H. Unwin; Practical Midwifery—prize: P. L. Daniel; Practical Chemistry—prize: G. S. Oades; Midwifery—prize: E. L. Lilley; Public Health—prize: P. L. Daniel; Therapeutics—prize: W. H. Park; Pathology—prize: R. J. Wilson; Forensic Medicine and Toxicology—prize: E. L. Lilley.

London (Royal Free Hospital) School of Medicine for Women.—Winter Session, 1897-98.—Biology: Miss Martin. Physics: Miss Hickman. Chemistry: Miss Hickman. Physiology: Miss Naylor. Medicine: Miss Watts. Midwifery and Gynæcology: Miss Turnbull, 1st Evans Prize; Miss Lovibond, 2nd Evans Prize; Miss Ford and Miss Watts, 3rd Evans Prize. Senior Anatomy: Mrs. Willey. Junior Anatomy: Miss Hooper. Organic Chemistry: Miss M. Smith. Summer Session, 1898.—Practical Organic Chemistry: Miss H. G. Jones. Practical Chemistry: Miss Simpson. Materia Medica: Mrs. Willey. Operative Midwifery: Miss Clapham, Evans Prize.

The London School of Dental Surgery.—Saunder's scholarship: W. H. Thomas; Ashs' Prize: W. H. Thomas. Class Prizes—Winter Session, 1897-98—Metallurgy—First Prize: W. H. Thomas. Second Prize: H. G. Williams. Dental Mechanics—First Prize: W. H. Thomas. Second Prize: H. H. Belsey. Practical Dental Surgery Prize—Prize: A. G. Payne.—Summer Session, 1898—Dental Anatomy—First Prize: W. H. Thomas. Second Prize: A. G. Payne and H. G. Williams. Dental Surgery—First Prize: W. H. Thomas. Second Prize: H. H. Belsey.

THE PRINCE OF WALES'S HOSPITAL FUND.

LAST year two stamps were issued on behalf of this fund. They produced a sum of about £35,000, and were issued to give small subscribers a handy and convenient form of receipt, which has become popular. This year a new issue for 1898 is made. It consists of four stamps, each of distinct design, with a face value of 1*s.*, 2*s.* 6*d.*, 5*s.*, and 10*s.* respectively. The designs for the stamps and the colours in which they are printed were selected by H.R.H. the Prince of Wales. The 1*s.* stamp is printed in red, the 2*s.* 6*d.* stamp in blue, the 5*s.* stamp in dark green, and the 10*s.* stamp in a lighter green. Each contains a vignette of the figure of Charity, with the words "Prince of Wales's Hospital Fund" and the date 1898 in the top right-hand corner. A facsimile of the Prince's signature appears at the bottom. The 1*s.*, 5*s.*, and 10*s.* stamps have the Prince of Wales's feathers introduced, whereas in the 2*s.* 6*d.* stamp these are replaced by a fleur-de-lis. The 10*s.* stamp is intended as a national emblem, the vignette being enclosed by an ornamental border containing the rose, shamrock, thistle, and leek. Our illustration shows the 5*s.* stamp.

The five-shilling stamp reproduced in black-and-white and enlarged by one-third, to show the details.

HOSPITAL REFORM IN IRELAND.

MR. T. GARRETT HORDER, the Secretary of the Hospital Reform Association, has sent us some statistics of the various hospitals in Ireland. In 1896 the population of Ireland was 4,486,100. The number of hospitals, including county infirmaries, is 92. Of this number the Dublin registration area with a population in 1891 of 349,594 has 31 hospitals. The proportion of hospitals to population is thus seen to be enormous. Some statistics follow with reference to various items in hospital management and income as regards Dublin.

THE DUBLIN HOSPITALS.

Number of hospitals in Dublin registration area	31
Number of beds	2,438
Population of registration area (1891)	349,594
Number of patients admitted in 1897	22,572
Number of out- or dispensary-patients (attendances)	149,766
Number of maternity patients (extern)	5,125

The following hospitals are supported almost entirely by Government grants:—

		Government grant.
House of Industry hospitals.	The Hardwicke Fever Hospital The Richmond Surgical Hospital The Whitworth Medical Hospital	£7472
	The Lock Hospital (females)	2000

The following are supported by Government grants, by assessments either on the county of Dublin or on the city of Dublin, by subscriptions and donations, by payments from patients, and by the Hospital Sunday Fund:—

	Hospital Sunday Fund	Government grant.	Subscriptions and donations.	Assessments.	Patients' payments.
	£	£	£	£	£
Steevens' Hospital	126	1,300	431	200	1,109
Meath Hospital	447	600	1,985	1,300	224
Cork-street Fever Hospital	186	2,500	668	260	3,544
Rotunda Lying-in Hospital	299	700	1,058	250	417
Coombe Lying-in Hospital	101 (1896)	500	325	200	24
Hospital for Incurables	—	250	1,055	350	—
St. Mark's Eye and Ear Hospital	107 (1896)	100	208	150	579

The following other hospitals receive grants from the Corporation of Dublin.

	Amount (1896).		Amount (1896.)
Sir Patrick Dun's Hospital	£450	National Children's Hospital	£125
City of Dublin Hospital	300	The Orthopædic Hospital	125
Mercer's Hospital	300	National Maternity Hospital	*
The Children's Hospital	?	St. Vincent's Hospital	?
Jervis-street Hospital	?		
Mater Misericordiæ Hospital	500		

Cork with a population of 75,345 has 12 hospitals with 629 beds, 3671 in-patients, 40,827 out-patients, and 383 maternity patients. Belfast with a population of 255,950 has 12 hospitals with 514 beds, 4466 in-patients, and 50,594 out-patients. County infirmaries number 32 with 1588 beds, 11,395 in-patients, and 24,963 out-patients. In all, these institutions possess 75 nurses and 22 probationers. The discrepancy between the relation of hospitals to population existing in Cork as compared with Belfast will strike the reader at once and it is obvious that some readjustment is urgently required.

Public Health and Poor Law.

LOCAL GOVERNMENT DEPARTMENT.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Chelsea Sanitary District.—Dr. Louis Parkes has turned his attention to the recent manifestations of scarlet fever and of diphtheria in the eight parishes constituting western London, and he furnishes in his annual report for 1897 two tables and some charts based upon the notifications of each of these diseases for 1890 to 1897. In dealing with Chelsea the district of Kensal Town has been very properly omitted as its topographical relations to Chelsea proper are obviously but remote. The lessons which Dr. Parkes draws from the tables are (1) that in the case of diphtheria fluctuations in its prevalence are much less marked than is the case with scarlet fever; (2) that the prevalence or absence of diphtheria is a much more local circumstance than is the prevalence or absence of scarlet fever, a disease which apparently possesses a greater diffusive power than does diphtheria. For instance, in dealing with diphtheria it is common to find it highly prevalent in one parish and but little prevalent in adjoining parishes, whereas scarlet fever has a greater tendency to diffuse itself over wider areas; the infection, however, of diphtheria is much more persistent in an invaded area than is that of scarlet fever. Dr. Parkes does not regard the future *quâ* diphtheria prevalence as discouraging, for the figures would seem to indicate that the wave of diphtheria prevalence which has passed over London since 1892 is now on the decline. As Dr. Parkes observes, the precise factors which may favour the persistence of diphtheria are but very imperfectly understood and it may be that social circumstances such as overcrowding and poverty are at least as potent for harm as are purely insanitary conditions; in other words, the extent of the prevalence of diphtheria is largely governed by opportunities for infection. Assuming, however, the diphtheria wave to be on the decline in London, what we have to do is to render both the social and sanitary condition of the population such that a wave of equal virulence will when it comes reap a smaller harvest.

Plymouth Urban District.—In advocating the erection of swimming baths Mr. F. M. Williams points out how very important it is in a place like Plymouth where there is a large seafaring population that every facility for learning to swim should be afforded. It seems that in the elementary schools of Plymouth only eight of the boys are able to swim. The number of articles disinfected during 1897 affords a capital illustration of the amount of labour which the arrival of an infected vessel necessitates. Many of our readers will remember the circumstances connected with the s.s. *Nubia*, which brought cases of cholera to Plymouth in January of last year, and they will read with interest that of 31,000 articles disinfected during 1897 no less than 27,000 came from the infected vessel. In dealing with the prevalence of disease, Mr. Williams deplores the extension of syphilis amongst the military, naval, and civil populations of our great centres, and in commenting thus he has doubtless in mind circumstances with which he is familiar in a garrison town like Plymouth. The repeal of the Contagious Diseases Act has, Mr. Williams states, been most disastrous as regards the moral and physical well-being of the young in great naval and military centres. It is certainly well that the medical officer of health should regard this question as distinctly a branch of preventive medicine. Whilst dealing with the subject of cattle inspection and milk-supply attention is called to the necessity for the inspection by a veterinary surgeon of all milch cows yielding milk for the people of Plymouth, and as a step in the right direction Mr. Williams has apparently prevailed upon the principal dairy company to set up a filtering and sterilising plant.

Brighton Urban District.—The population of Brighton in 1897 was estimated at 121,401, and for the year in question the general death-rate was but 15·3 per 1000—the lowest yet recorded for Brighton. Under the heading of small-pox Dr. Newsholme furnishes a series of diagrams illustrating very clearly the altered age incidence of fatal small-pox side by side with the extension or diminution of the practice of vaccination. With the decrease of vaccination which has taken place within recent years we see a tendency for small-pox to revert to its pre-vaccination incidence on the infantile population, and we much fear that the next decade will witness a marked accentuation of this tendency. As regards enteric fever, Dr. Newsholme reports that detailed investigation was made into the circumstances connected with the 88 cases which originated in Brighton during 1897, and it appeared from the evidence procurable that in 47 cases no shellfish had been eaten within three weeks of attack; in 11 cases there was doubt as to the point, and in 27 cases shellfish derived from a sewage-contaminated source had been consumed at a time consistent with their having been the cause of the attack. In the 3 remaining cases the patients were intimately connected with the sale or storage of shellfish. It would seem, therefore from this that some 27 or 30 cases of enteric fever may have derived their infection from specifically contaminated shellfish; indeed, from the details with regard to certain illustrative cases, a thesis of this nature would appear to be the best and most reasonable explanation. Unfortunately we cannot well ascertain the incidence of enteric fever on the shellfish-eating community as compared with that upon the non-shellfish-eating community, and in all questions of this nature the decision must be arrived at by building up the best chain of evidence possible from the links available. It is to be deplored that ere this we have not had legislation in reference to this question of shellfish culture and disease, and it is to be hoped that Mr. Chaplin may early next session be able to introduce his long-expected and much-needed measure. Dr. Newsholme gives an interesting account of the means taken in Brighton to control the spread of measles, and he expresses the opinion that notification of this disease would only be successful if dual notification were rigidly enforced, and if only the first case in a household outbreak should require to be notified by the medical practitioner. He would, however, have the parent notify every case.

Blackpool Urban District.—There were but 50 cases of enteric fever notified in Blackpool during 1897 as against 66 in the previous year, but as there were 15 deaths in 1897 and only 13 in 1896 Dr. Jasper Anderson regards it as probable that a number of slight cases are not reported. We expect this is a very common feature in every town, but it may obviously obtain in some years more than in others according as to whether the type of the disease is well or ill developed. One death from typhus fever—infection introduced from Liverpool—occurred in Blackpool during 1897.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In thirty-three of the largest English towns 6583 births and 4988 deaths were registered during the week ending August 27th. The annual rate of mortality in these towns, which had increased in the six preceding weeks from 14·7 to 22·0 per 1000, further rose to 23·2. In London the rate was 21·5 per 1000, while it averaged 24·3 in the thirty-two provincial towns. The lowest death-rates in these towns were 13·7 in Huddersfield, 16·5 in Oldham, 16·8 in Nottingham, and 16·9 in Swansea; the highest rates were 30·9 in Liverpool, 32·3 in Preston, 35·2 in Sunderland, and 38·5 in Wolverhampton. The 4988 deaths in these towns included 1541 which were referred to the principal zymotic diseases, against 1127 and 1250 in the two preceding weeks; of these, 1321 resulted from diarrhœa, 84 from whooping-cough, 53 from measles, 45 from diphtheria, 19 from "fever" (principally enteric), and 19 from scarlet fever. The lowest death-rates from these diseases were recorded in Swansea, Oldham, Burnley, Huddersfield, and Halifax; and the highest rates in Wolverhampton, Salford, Preston, and Sheffield. The greatest mortality from measles occurred in Wolverhampton and Norwich; from whooping-cough in Sheffield, Sunderland, and Swansea: and from diarrhœa in Liverpool, Birkenhead, Leicester, Salford, Wolverhampton, Preston, and Sheffield. The mortality from scarlet fever and from "fever" showed no marked excess in any of the large towns. The 45 deaths from diphtheria included 21 in London, 4 in Liverpool, and 3 in West Ham. No fatal case of small-pox was registered last week in any of the thirty-three large towns, and only 2 small-pox patients were under treatment in the Metropolitan Asylum Hospitals on Saturday, August 27th. The number of scarlet fever patients in these hospitals and in the London Fever Hospital at the end of

the week was 2178, against 2326, 2293, and 2241 on the three preceding Saturdays; 182 new cases were admitted during the week, against 224, 201, and 187 in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had been 171 and 196 in the two preceding weeks, declined again to 135, and were 24 below the corrected average. The causes of 54, or 1·1 per cent., of the deaths in the thirty-three towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Portsmouth, Cardiff, Nottingham, Oldham, and in eleven other smaller towns; the largest proportions of uncertified deaths were registered in Bristol, Leicester, Liverpool, and Preston.

In thirty-three of the largest English towns 6749 births and 5242 deaths were registered during the week ending Sept. 3rd. The annual rate of mortality in these towns, which had increased in the seven preceding weeks from 14·7 to 23·2 per 1000, further rose last week to 24·4. In London the rate was 22·0 per 1000, while it averaged 26·0 in the thirty-two provincial towns. The lowest death-rates in these towns were 15·1 in Halifax, 15·3 in Huddersfield, 17·2 in Oldham, and 17·3 in Portsmouth; the highest rates were 31·1 in Bolton, 31·2 in Gateshead, 36·7 in Wolverhampton and in Salford, and 37·0 in Sunderland. The 5242 deaths in these towns included 1646 which were referred to the principal zymotic diseases, against 1250 and 1541 in the two preceding weeks; of these, 1438 resulted from diarrhœa, 75 from whooping-cough, 43 from diphtheria, 40 from "fever" (principally enteric), 30 from measles, 19 from scarlet fever, and 1 from small-pox. The lowest death-rates from these diseases were recorded in Plymouth, Oldham, Huddersfield, and Halifax; and the highest rates in Wolverhampton, Salford, Bolton, Preston, and Sunderland. The greatest mortality from whooping-cough occurred in Croydon, Halifax, and Sunderland; and from diarrhœa in Wolverhampton, Leicester, Salford, Bolton, Preston, Sheffield, Hull, and Sunderland. The mortality from measles, from scarlet fever, and from "fever" showed no marked excess in any of the large towns. The 43 deaths from diphtheria included 19 in London, 5 in Swansea, 4 in Leeds, 3 in Birkenhead, and 3 in Liverpool. One fatal case of small-pox was registered in Gateshead, but not one in London or in any other of the thirty-three large towns; and only 2 small-pox patients were under treatment in the Metropolitan Asylum Hospitals on Saturday last, Sept. 3rd. The number of scarlet fever patients in these hospitals and in the London Fever Hospital at the end of last week was 2240, against 2293, 2241, and 2178 on the three preceding Saturdays; 238 new cases were admitted during the week, against 201, 187, and 182 in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had been 196 and 135 in the two preceding weeks, further declined to 127 last week, and were 16 below the corrected average. The causes of 44, or 0·8 per cent. of the deaths in the thirty-three towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in West Ham, Bristol, Nottingham, Bradford, and in thirteen other smaller towns; the largest proportions of uncertified deaths were registered in Leicester, Liverpool, Huddersfield, and Sheffield.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had been 19·8 and 18·1 per 1000 in the two preceding weeks, rose again to 18·4 during the week ending August 27th, but was 4·8 per 1000 below the mean rate during the same period in the thirty-three large English towns. The rates in the eight Scotch towns ranged from 11·9 in Perth and 13·0 in Leith to 26·4 in Greenock and 28·9 in Paisley. The 556 deaths in these towns included 89 which were referred to diarrhœa, 27 to whooping-cough, 9 to "fever," 8 to measles, 5 to scarlet fever, and 2 to diphtheria. In all, 140 deaths resulted from these principal zymotic diseases, against 136 and 118 in the two preceding weeks. These 140 deaths were equal to an annual rate of 4·6 per 1000, which was 2·6 below the mean rate last week from the same diseases in the thirty-three large English towns. The fatal cases of diarrhœa, which had been 80 and 70 in the two preceding weeks, rose again to 89 last week, and included 44 in Glasgow, 11 in Paisley, 9 in Edinburgh, and 9 in Dundee. The 27 deaths from whooping-cough showed a slight further increase upon recent weekly numbers, and included 8 in Glasgow and 8 in Aberdeen. The deaths referred to different forms of "fever," which had increased from 1 to 9 in the three preceding weeks, were again 9 last week, of which 8 occurred in Glasgow. The 8 fatal cases of measles exceeded by 2 the number registered in the preceding week, and included 3 in Glasgow, where 2 of the 5 deaths from scarlet fever were also recorded. The deaths referred to diseases of the respiratory organs in these towns, which had been 71 and 80 in the two preceding weeks, declined again to 64, and were 14 below the number in the corresponding period of last year. The causes of 24, or more than 4 per cent., of the deaths in these eight towns were not certified.

The annual rate of mortality in the eight Scotch towns, which had been 18·1 and 18·4 per 1000 in the two preceding weeks, further rose to 19·8 during the week ending Sept. 3rd, but was 4·6 per 1000 below the mean rate during the same period in the thirty-three large English towns. The rates in the eight Scotch towns ranged from 13·6 in Perth, and 17·4 in Aberdeen to 27·9 in Leith and 28·9 in Greenock. The 596 deaths in these towns included 81 which were referred to diarrhœa, 22 to whooping-cough, 9 to "fever," 5 to measles, 5 to scarlet fever, and 2 to diphtheria. In all, 124 deaths resulted from these principal zymotic diseases against 118 and 140 in the two preceding weeks. These 124 deaths were equal to an annual rate of 4·1 per 1000, which was 3·5 below the mean rate last week from the same diseases in the thirty-three large English towns. The fatal cases of diarrhœa, which had been 70 and 89 in the two preceding weeks, declined to 81 last week, of which 39 occurred in Glasgow, 12 in Edinburgh, 9 in Leith, and 7 in Greenock. The 22 deaths from whooping-cough showed a decline of 5 from the number in the preceding week, and included 13 in Glasgow and 5 in Aberdeen. The deaths referred to different forms of "fever," which had been 9 in each of the two preceding weeks, were again 9 last week, of which 5 occurred in Glasgow and 2 in Paisley. The 5 fatal cases of scarlet fever also corresponded with the number recorded in the preceding week, and included 3 in Edinburgh and 2 in Glasgow. The deaths referred to diseases of the respiratory organs in these towns, which had been 80 and 64 in the two preceding weeks, rose again to 72 last week, and slightly exceeded the number in the corresponding period of last year. The causes of 34, or nearly 6 per cent. of the deaths in these eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 25·5 and 21·8 per 1000 in the two preceding weeks, rose again to 22·4 during the week ending August 27th. During the four weeks ending on that date the death-rate in the city averaged 23·4 per 1000, the rate during the same period being 21·0 in London and 17·1 in Edinburgh. The 150 deaths registered in Dublin during the week under notice showed a slight increase upon the number in the previous week, and included 29 which were referred to the principal zymotic diseases, against 31 and 28 in the two preceding weeks; of these, 24 resulted from diarrhœa, 3 from "fever," 2 from diphtheria, but not one either from small-pox, measles, scarlet fever, or whooping-cough. These 29 deaths were equal to an annual rate of 4·3 per 1000, the zymotic death-rate during the same period being 6·4 in London and 2·5 in Edinburgh. The fatal cases of diarrhœa, which had increased from 4 to 22 in the five preceding weeks, further rose to 24. The deaths referred to different forms of "fever," which had been 3 in each of the two preceding weeks were again 3 during the week under notice. The 2 fatal cases of diphtheria exceeded the number recorded in any recent week. The 150 deaths in Dublin included 51 of infants under one year of age, and 29 of persons aged upwards of sixty years; the deaths of infants showed a slight further increase upon recent weekly numbers, while those of elderly persons showed a decline. Four inquest cases and 4 deaths from violence were registered, and 51, or rather more than a third, of the deaths occurred in public institutions. The causes of 10, or nearly seven per cent. of the deaths in the city were not certified.

The death-rate in Dublin, which had been 21·8 and 22·4 per 1000 in the two preceding weeks, further rose to 27·6 during the week ending Sept. 3rd. During the four weeks ending on Saturday last the rate of mortality in the city averaged 24·3 per 1000, the rate during the same period being 21·9 in London and 17·1 in Edinburgh. The 185 deaths registered in Dublin during the week under notice showed an

increase of 35 upon the number in the preceding week, and included 39 which were referred to the principal zymotic diseases, against 28 and 29 in the two preceding weeks; of these, 33 resulted from diarrhœa, 4 from whooping-cough, 1 from measles, 1 from "fever," but not one either from small-pox, scarlet-fever, or diphtheria. These 39 deaths were equal to an annual rate of 5·8 per 1000, the zymotic death-rate during the same period being 5·9 in London and 3·2 in Edinburgh. The fatal cases of diarrhœa, which had increased in the five preceding weeks from 9 to 24, further rose to 33 last week. The 4 deaths referred to whooping-cough exceeded the number recorded in any recent week, while the mortality from "fever" showed a decline. The 185 deaths in Dublin last week included 62 of infants under one year of age, and 33 of persons aged upwards of sixty years; the deaths both of infants and of elderly persons showed a further increase upon those recorded in recent weeks. Seven inquest cases and 8 deaths from violence were registered; and 53, or more than a fourth of the deaths occurred in public institutions. The causes of 16, or nearly 9 per cent. of the deaths in the city last week were not certified.

THE SERVICES.

NEW WARRANT FOR THE INDIAN MEDICAL SERVICE.

THE following is the text of the Warrant published in the *London Gazette* of Friday, August 26th, granting new titles to the Indian Medical Service:—

India Office, August 26th, 1889.

VICTORIA, R.I.

Whereas We have deemed it expedient to alter the Ranks of the Officers of Our Indian Medical Service:

Our Will and Pleasure is that the following alterations shall be made:

Present Ranks.	New Ranks.
Surgeon-Colonel	Colonel.
Brigade-Surgeon-Lieutenant-Colonel ... ... / Surgeon-Lieutenant-Colonel	Lieutenant-Colonel.
Surgeon-Major	Major.
Surgeon-Captain	Captain.
Surgeon-Lieutenant	Lieutenant.

Officers above the rank of Surgeon-Colonel shall in future be styled Surgeon-Generals (ranking as Major-Generals), and the title of Surgeon-Major-Generals now serving shall be altered accordingly.

It is further Our Will and Pleasure that the following alterations shall be made in the honorary rank of the Senior Assistant Surgeons of the Subordinate Medical Department in India:

Present Honorary Ranks.	New Honorary Ranks.
Surgeon-Major	Major.
Surgeon-Captain	Captain.
Surgeon-Lieutenant	Lieutenant.

Given at Our Court at Osborne, this tenth day of August, one thousand eight hundred and ninety-eight, in the sixty-second year of Our reign.

By Her Majesty's Command.

GEORGE HAMILTON.

ROYAL NAVY MEDICAL SERVICE.

Staff-Surgeon Horace Ximenes Browne has been promoted to the rank of Fleet-Surgeon in Her Majesty's Fleet. Staff-Surgeon Charles William Buchanan-Hamilton has been promoted to the rank of Fleet-Surgeon in Her Majesty's Fleet. Staff-Surgeon Arthur William May has been promoted to the rank of Fleet-Surgeon in Her Majesty's Fleet. Staff-Surgeon Charles Hazlitt Upham has been allowed to withdraw from Her Majesty's Service with a gratuity.

The following appointments are notified:—Fleet-Surgeons: John Lyon to the *President*; William R. White to the *Magnificent*; and George W. Bell to the *Hannibal*. Staff-Surgeons: John Lowney to the *Proserpine*; Daniel J. P. McNabb to the *Northampton*; Hamilton Meikle to the *Pearl*; E. G. Swan to the *Collingwood*; and F. J. Burns to the *Boscawen*. Surgeons: Herbert Holyoake to the *Pembroke*, additional; Harold G. T. Major to the *Victory*; Shirley H. Birt to the *Victory*; Henry W. Finlayson to the *Vivid*; Robert S. Bernard James, W. W. Stanton, and Arthur E. Kelsey to Haslar Hospital; William Hackett to Plymouth Hospital; Joseph C. Wood to the *Britannia*; and Charles R. Sheward to the *Vivid*.

ROYAL ARMY MEDICAL CORPS.

The under-mentioned officers retire on retired pay: Colonel Charles F. Pollock and Major Arthur Harding, half-pay. Lieutenant-Colonel H. Charlesworth has assumed the duties of Recruiting and Embarking Medical Officer (Portsmouth). Major T. G. Lavie has embarked for Egypt.

ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Captain Robert Stirling, M.D., 4th Volunteer Battalion the Black Watch (Royal Highlanders), to be Surgeon-Captain.

MILITIA MEDICAL STAFF CORPS.

Surgeon-Captain W. W. Lake to be Surgeon-Major.

VOLUNTEER CORPS.

Artillery: 8th Lancashire: Surgeon-Major A. R. Hopper to be Surgeon-Lieutenant-Colonel. 1st Shropshire and Staffordshire: Surgeon-Captain R. P. Mackenzie, M.B., resigns his commission. 1st Sussex: Surgeon-Lieutenant G. A. Skinner resigns his commission. *Rifle:* 9th Lanarkshire: The under-mentioned Surgeon-Lieutenants to be Surgeon-Captains: A. Campbell, M.B., and J. Bradford. 2nd Volunteer Battalion the Royal Fusiliers (City of London Regiment): Surgeon-Captain E. D. Berton, M.B., to be Surgeon-Major. 3rd Volunteer Battalion the King's (Liverpool Regiment): Surgeon-Captain F. F. Moore resigns his commission; also is granted the rank of Surgeon-Major, with permission to continue to wear the uniform of the battalion on his retirement. 2nd (Berwickshire) Volunteer Battalion the King's Scottish Borderers: Alexander John Campbell, M.B., to be Surgeon-Lieutenant.

THE ROYAL ARMY MEDICAL CORPS IN THE SOUDAN.

The following are the arrangements in detail:—

The principles and methods laid down in the regulations for the provision of hospital and medical services in the field have been followed in the late Soudan expedition, with such additions and modifications as were considered necessary to best adapt them to the climate, to the nature of the expedition, and to the work which had to be fulfilled. A medical officer accompanied every corps unit; brigades were furnished with sectional field hospitals and these were also attached to the cavalry and artillery; the wounded and sick were transported from the front by the Nile to Atbara in barges specially fitted up as temporary hospitals. The water-carriage of wounded is, it may be remarked, about the best and most comfortable transport which can be devised for the purpose. Large stationary hospitals, which are equipped with all practicable conveniences and comforts, are located at Atbara, Abadia, Wady Halfa, and Shellal. Two sets of Roentgen ray apparatus have also been provided.

The citadel hospital at Cairo is a very fine, well-placed and well-ventilated building; the weakest point about it is the conservancy accommodation; but the dry earth system is, or was, in use and is most carefully supervised and worked.

Principal Medical Officer—Surgeon-General Taylor.
Secretary—Major Wilson, C.M.G.
Principal Medical Officer of the British Division of two Brigades—Lieutenant-Colonel Macnamara.

First Brigade.

Senior Medical Officer—Lieutenant-Colonel Sloggett.
Warwickshire Regiment—Major Irwin.
Lincolnshire Regiment—Major Adamson.
Cameron Highlanders—Captain Mathias.
Seaforth Highlanders—Lieutenant Bliss.
Five sectional field hospitals of 25 beds each are attached to this brigade:—
No. 1 Sectional Field Hospital—Major Myles.
No. 2 Sectional Field Hospital—Major Webb.
No. 3 Sectional Field Hospital—Major Robinson.
No. 4 Sectional Field Hospital—Major Wardrop.
No. 5 Sectional Field Hospital—Major Dodd.

Second Brigade.

Senior Medical Officer—Lieutenant-Colonel Hughes.
1st Battalion Grenadier Guards—Major Kilkelly and Captain Austin.

Northumberland Fusiliers—Lieutenant Jephson.
Lancashire Fusiliers—Captain Luther.
Rifle Brigade—Major O'Callaghan.

Five sectional field hospitals of 25 beds each are attached to this brigade:—

No. 6 Sectional Field Hospital—Major M'Neece.
No. 7 Sectional Field Hospital—Major Wilkinson.
No. 8 Sectional Field Hospital—Major Stewart.
No. 9 Sectional Field Hospital—Major Thompson.
No. 10 Sectional Field Hospital—Major Jones.

Cavalry and Artillery.

21st Lancers—Major Pinches.
Artillery—Major Clarkson and Lieutenant Gaine.

To the Cavalry is attached:—

No. 11 Sectional Field Hospital of 25 beds—Major Sawyer.

To the Artillery:—

No. 12 Sectional Field Hospital, with 25 beds—Major Barnes.

The Convoy of the Wounded.

The wounded will be taken down the Nile on barges fitted as temporary hospitals to four stationary hospitals at Shellal, Wady Halfa, Abadia, and Atbara. Each convoy boat contains 25 beds. The medical officers in charge are:—Major Hunter, D.S.O., Captain Reily, Captain Graham, Lieutenant Huddlestone, Major Carr, Captain Thomson, Captain Peeke, Lieutenant M'Kessack.

Shellal Hospital is close to Assouan. It contains 50 beds under the charge of the following medical officers:—Captain J. Hayes and Lieutenant Hearn.

Wady Halfa Hospital also contains 50 beds under the charge of the following medical officers:—Major Baylor and Captain Alexander.

Abadia Hospital is a little north of Berber. It is a larger hospital than the two more northern ones, offering accommodation for 300. The medical staff is as follows:—Lieutenant-Colonel Clery, Major Geoghegan, Major Battersby, Major Marder, Major Allen, Major Braddell, Major Burrows, Captain Girvan, Captain Borrodaile, Lieutenant M. Corkery, Lieutenant Cummins, Lieutenant M'Ardle, and Lieutenant Stallard. The hospital is well found in every respect and is provided with proper hospital clothing and bedding and sheets. A telegram from the Sirdar dated Sept. 5th states that the wounded had arrived safely at Abadia and were doing well.

Atbara Hospital is the most southern stationary hospital and is situated where the river Atbara joins the Nile. It will accommodate as many as 300 patients if tents are also brought into use. The following are the medical officers:—Lieutenant-Colonel Leader, Major Smythe, Major Birrell, Lieutenant S. Archer, and Lieutenant Hopkins.

THE PRESENT OUTLOOK.

We are certainly living in very sensational times. Look which way we will we are encountered by matters of the gravest importance and greatest interest. The late Spanish-American war, the Czar's peace manifesto, the Dreyfus affair and the consequent agitation and unrest of France, the Soudan expedition with the victory of Omdurman and the capture of Khartoum, the partition of China and at the present moment the renewed difficulties in Crete. In India, too, there is much cause for anxiety from the continued prevalence of plague, the still unsettled state of the tribes on the North-west frontier and the perennial question of Indian finance and the coinage. The present is not a very hopeful time for the political economist and the Government of this country will apparently need all its resources and will, at any rate, have to keep its medical services up to the mark as regards numbers and efficiency. Let us hope that matters may have improved before the Congress meets to consider the wise and benevolent proposals of the Czar as to the possibility of limiting the competition of the Powers in the terrible race for naval and military supremacy.

LIEUTENANT-COLONEL SLOGGETT.

We regret to learn that Lieutenant-Colonel A. T. Sloggett, R.A.M.C., was severely wounded in the breast during the splendid battle before Omdurman. Lieutenant-Colonel Sloggett, who is Senior Medical Officer of the First Brigade, is an old fighting hand in Africa. Two years ago he served with the Dongola Expeditionary Force under the present Sirdar and was present in the engagement at Firket and the operations at Hafir. He was mentioned in the despatches and promoted to be Surgeon-Lieutenant-Colonel, and he also received the Fourth Class of the Osmanieh and the Khedive's medal. The latest account as we go to press gives a good report of Colonel Sloggett's wound.

NAPOLEON'S MEDICAL ATTENDANT AT ST. HELENA.

Baron Antomarchi, a grand-nephew of Napoleon's medical attendant at St. Helena, has published in *La Réforme Hebdomadaire* an interesting account of the campaign in Cuba. His great-uncle, Dr. Antomarchi, settled in Cuba in 1834, but died there four years later from yellow fever. His family, however, continued to reside in the island, where they acquired large possessions and enjoyed the society of a number of French planters who had been obliged to fly for refuge to the Queen of the Antilles on the breaking out of the revolution in San Domingo.

DEATHS IN THE SERVICES.

Brigade-Surgeon-Lieutenant-Colonel Benjamin Burland, M.B. (retired), A.M.S., at his residence in London, on August 30th, aged sixty-six years. He entered the Army in 1858, became Surgeon in 1865, Surgeon-Major in 1873, and retired in 1884. He was promoted Staff-Surgeon in consideration of highly meritorious service rendered during the epidemic of yellow fever at Bermuda.

Major George Schuyler Cardew, Royal Army Medical Corps, on August 17th, at Murree, India, aged thirty-seven years.

THE CAMP NEAR OMDURMAN.

The Sirdar and the medical authorities of the Soudan expeditionary army acted very wisely in encamping their victorious forces outside the city of Omdurman. The stench from the corpses of men and beasts which strewed the ground was most offensive and in other respects the city was so insanitary that a very serious outbreak of disease was certain to have occurred had the place been occupied by troops after an exhausting campaign.

THE LATE SPANISH-AMERICAN WAR.

Although the war is over the United States Government will have a good many difficult problems to settle. Questions with regard to the sickness and loss of life alleged to have been caused by the occupation of insanitary camps and want of proper medical arrangements during the late war still occupy the public mind and, as might have been expected, have given rise to much controversy.

The *Army and Navy Gazette* of Sept. 3rd says:—"Fleet-Surgeon A. Gorham's retirement last week brought various changes in the Medical Department. Fleet-Surgeon J. Lyon, of the *Magnificent*, relieves him in the *President*, while Fleet-Surgeon W. R. White, C.B., of the *Hannibal*, goes to the former vessel, and Fleet-Surgeon G. W. Bell, late of the *Crescent*, takes the place of the latter officer."

Surgeon-General Marston, C.B., Army Sanitary Committee, accompanied by Mr. Frederick, the secretary, visited Plymouth yesterday (Sept. 9th) and inspected the buildings recently erected in the citadel.

LITERARY INTELLIGENCE.—Messrs. Archibald Constable and Co. announce the publication of a biographical memoir of the late Dr. E. Schnitzer, known to the world as "Emin Pasha," Governor of the Egyptian Equatorial Province and Scientific Explorer in Central Africa. Emin Pasha's career was in every way remarkable; this, the only official account of his life and work, which is a slightly abbreviated translation from the German edition, compiled by his brother-in-law, will be particularly interesting at the present moment as giving many a side-light on German colonial methods at the time when the Anglo-Egyptian expedition has reached Khartoum. Dr. R. W. Felkin, a personal friend and for long a correspondent of Emin, has written an introduction to the English edition of the book explaining what assistance Emin asked for from Britain and how his requests were met.—The Scientific Press, Limited, will shortly publish an Atlas of Bacteriology, by Charles Slater, M.D. Cantab., and E. J. Spitta, L.R.C.P. Lond., M.R.C.S. Eng. The book will be copiously illustrated with photographs.

Correspondence.

"Audi alteram partem."

SAWDUST URINALS.

To the Editors of THE LANCET.

SIRS,—Some few years since I took occasion to direct attention to the value of sawdust in rendering urine filtered through it thoroughly aseptic; and the present dearth of water for sanitary purposes is my reason for asking you to allow me to direct the attention of sanitary authorities to this fact; and to advise them to give sawdust urinals a trial, as my increasing experience in this matter leads me to say that when properly constructed they are thoroughly satisfactory. There should always be complete exposure to light and air, but protection from rain is advisable. No better urinal can be devised than a tall bushel basket filled with deal sawdust and placed in a shed. Such a urinal in dry hot weather will take a surprising amount of urine without affording any filtrate, owing to the freedom of evaporation. If the use of such a urinal be not excessive and if it be stirred occasionally it will increase in effectiveness with use. If the nose be placed close to the surface of such a urinal it will be found to be strongly ammoniacal, but I have never known one to be foul. The filtrate is usually slightly aromatic and has never shown any disposition to putrefy. I do not know how often the sawdust needs to be changed. I lately examined the sawdust which had been used for three months in the urinal of a country public-house and I found it absolutely free from all offensive odour.

When such urinals are not made of basket-work they must have an outlet at the bottom through which the aseptic filtrate may escape to the drain. Those who may wish for further details as to the construction of sawdust urinals will find them in my little book, "The Dwelling House," which is published by Longmans.

I am, Sirs, yours faithfully,

Sept. 2nd, 1898. G. V. POORE, M.D.

"THE PLAISTOW MATERNITY CHARITY."

To the Editors of THE LANCET.

SIRS,—With reference to your remarks on the Plaistow Maternity Charity" in Howard's-road, Plaistow, in THE LANCET of August 27th, I beg to state that St. Mary's Day Nursery and Hospital for Sick Children, Plaistow, E., is in no way connected with the St. Mary's Children's Hospital, Plaistow, E.

I am, Sirs, yours faithfully,

W. W. FARNFIELD, Resident Medical Officer.

St. Mary's Children's Hospital, Plaistow, E., August 30th, 1898.

To the Editors of THE LANCET.

SIRS,—In the article in THE LANCET of August 27th referring to the East Suburban Medical Protection Society your contributor deals with nursing charities to some extent from a medical man's point of view, and passes certain strictures which are wholly undeserved upon the Maternity Charity and District Nurses' Home, Plaistow. It is no part of your aim to deal with the subject from the patient's point of view, and therefore any observations upon that head would be out of place. In the interest, however, of the charity to which you refer, there are certain misstatements of fact in that article which ought to be corrected. In all ordinary cases—that is to say, in all the district nursing and most of the midwifery—no payment whatever is received, and the frequent reference to fees in your article is most misleading. Further, as regards the district nursing, no patient is nursed unless attended by a medical man, except in a few trifling cases, such as cut fingers, for which no doctor would be called in. As to the case of people who have been attended who might be able to afford a nurse, it may be pointed out that these cases are extremely rare, numbering certainly not more than 2 in every 1000 cases attended, and in each case there has been a special reason for the attendance.

As regards the midwifery work it should be observed that in the great majority of the cases no payment is made, and that the fee, in such cases where it is payable, was raised from 5*s.* to 10*s.* with a view to meeting certain objections advanced by this medical protection society. The sum of 10*s.* was fixed upon because this pays the whole expense of the attendance, so that it is a misrepresentation to suggest that the patient gets any benefit out of the donations to the charity or, on the other hand, that the charity makes any profit out of the patient. The right of the patient to choose between a midwife and a local medical man, and where she insists on a midwife—as many poor women will—the desirability of ensuring that a properly certificated midwife shall be in attendance, are matters which are beside the point of your article, though not in themselves unimportant.

In conclusion, it is desirable to state a fact, which is probably well known to your contributor, that the advantage to the local practitioners of the presence of this charity is very great. The local medical men are constantly asking for nurses to attend their cases and returning warm thanks for their being sent; the more important practitioners are enabled in this way to attend cases which must otherwise go to hospital; they often have patients sent them by the nurses and, in fact, their demands for nursing attendance tax to the utmost the resources of the charity.

I am, Sirs, yours faithfully,

Inner Temple, August 30th, 1898. ARTHUR PRITCHARD.

THE PERSHORE GUARDIANS AND THEIR POOR-LAW MEDICAL OFFICERS.

To the Editors of THE LANCET.

SIRS,—The Pershore Guardians, at the last annual election of their medical officers, advertised for candidates who would waive all claim to superannuation. The Local Government Board, upon representation being made to them, informed the guardians that the arrangement was not one to which they could consent. It would seem now, according to a report of the proceedings of the guardians in the *Evesham Journal and Four Shires Advertiser*, to be the intention of certain members of that board to oust at least one of their medical officers, who has served them for nearly thirty years, by appointing at their next election a medical man they would get to "reside" in the district, and thus unless the Local Government Board again interfere he will not only lose his appointment but have the annoyance of being opposed under most unfair circumstances.

I am, Sirs, yours faithfully,

ARTHUR GREENWOOD,

Honorary Secretary, Poor-Law Medical Officers' Association, 3, Copthall-avenue, London Wall.

August 31st, 1898.

VITALITY.[1]

To the Editors of THE LANCET.

SIRS,—Dr. Harry Campbell will, I hope, pardon me for this late reply. Having recently occupied so many columns of THE LANCET I did not like to ask for space until the last of "Vitality" was published. Perhaps I may be allowed to remark that in replying to those who may differ from me I shall be as brief as possible and shall compress what I may deem it right to say in less than half a column of the journal.

If, as Dr. Harry Campbell considers, vitality is to be regarded "as a peculiar play of forces belonging to the inanimate world" I venture to inquire what it is that governs, controls, and regulates the particular forces of that very small portion of the matter of the inanimate part of our world which alone has entered or ever will enter into the composition of living things.

Although I consider that the "immaterial" does act, ever has acted, and will continue to act upon the "material," I cannot think that I occupy "a position as untenable as that of the spiritualists" which has been assigned to me by Dr. Harry Campbell, who also tells your readers that my assumption "that bioplasm is structureless" is "wholly *illogical*," because forsooth "*in our journey into the world of the infinitesimal we come sooner or later to a point at which we cease to detect structure!*" (The italics are mine.) I

[1] In reply to Dr. Harry Campbell's letter to THE LANCET of July 16th.

cannot say, with Dr. Harry Campbell, "I believe in the spontaneous evolution of life," because I do not, never did, and never can believe in anything of the kind.

If Dr. Harry Campbell will define the characters of his "cell," and tell us what it does, what it looks like when magnified about 250 linear, how it began life, how it works, and what happens when it dies, I will do my best to convince your readers that facts demonstrated are to be accounted for, if we only begin with structureless bioplasm and go on to formed material.

In this discussion concerning the nature of life—Vitality—I must beg opponents of any views of mine not to include me in any class or section whatever of believers, unbelievers, materialists or spiritualists, sceptics or agnostics (who beat us all in *knowing*), for among those who devote themselves to science and the real, and are influenced by reason in their search after truth, are members of all "denominations" under the sun.

Let us, then, begin by considering the *matter that is alive* and the *formed material*—bioplasm and tissue—the "energy" of the living body and the "energy" of the dead body—the well-constructed laboratory with its intelligent working chemists and physicists, and the *living laboratory* with the chemical and physical changes therein, and then perhaps we may be ready to begin to prepare for "our journey into the infinitesimal," or rather "into" that infinitesimal portion of it that is *alive*.—I am, Sirs, yours faithfully,

Grosvenor-street, W., Sept. 2nd, 1898. LIONEL BEALE.

HOSPITAL REFORM ASSOCIATION.

To the Editors of THE LANCET.

SIRS,—Will you kindly allow me space to ask your readers whether they are of opinion that it would be desirable and useful to hold a congress in London some time during the ensuing year to discuss the following subjects: (1) The reform of the out-patient department of hospitals; (2) the desirability of converting all free dispensaries into provident dispensaries; (3) the best method of conducting provident dispensaries. I may say at once that the promotion of such a congress would entail a good deal of expense and we should be compelled to appeal to the profession for special help to carry it out. The Hospital Reform Association has been able, with a very limited income, to arouse public interest in the hospital question, and has to a certain extent been the means of bringing about some tangible reforms. Much work, however, remains to be done, and it would be a pity that it should not be accomplished for the want of proper support from the profession.

I am, Sirs, your obedient servant,

Cardiff, Sept. 6th, 1898. T. GARRETT HORDER.

THE CONGRESS OF PHYSIOLOGY.

(BY OUR OWN CORRESPONDENT.)

THE Fourth Triennial Congress of Physiologists took place at Cambridge University between August 23rd and 26th and was an unqualified success, though the lay press hardly discovered its existence. It was perhaps partly overshadowed by the better-known Congress of Zoology, whose 400 members held their meetings during the same week. But while they admitted many amateurs to their sections the physiologists were rigorous in only receiving those connected with their own subject and the allied sciences. So it happened that out of 232 members 154 were professors or lecturers, and 16 foreign countries were represented, including Egypt, India, and Japan. It is difficult out of 91 communications to know which to comment upon, but it seemed to be the general opinion of the foreign members that the English papers were of good value and of commendable brevity and lucidity.

The official business of the Congress was formally opened by a few pithy words of welcome and direction from the President, Professor FOSTER, on Tuesday morning, August 23rd. The President intimated that the object of the meeting was primarily to see actual experiments rather than to listen to verbal or even receive merely pictorial demonstrations.

An early paper of much interest was one by Professor KOSSEL (Marburg) on the Proteid Molecule. The hexon bases into which the molecule can be split are found in various amounts in different species of proteids. Their quantity is greatest in the newly recognised proteid histon and they are least in quantities in elastin. The physiological value of these substances differs, therefore, considerably within the limits of the albuminous group.

Professor BEER (Vienna) showed a number of experiments demonstrating the mode of production of visual accommodation in various groups of animals. The mechanism employed in the human eye is not that universally obtaining even in vertebrata. The same object is attained in amphibians and snakes by the shifting forward of the lens when objects near at hand have to be focussed. In fishes the active accommodation is not for near vision but for far vision, and in them a muscle, the retractor lentis, draws the lens towards the retina for vision of distant objects. Some vertebrates, even mammals, have no power of accommodation; the water tortoises have a relatively enormous accommodative range.

Professor BIEDL (Vienna) demonstrated the production of glycosuria by ligation of the thoracic duct and the alleviation of the symptom by the intravenous injection of lymph.

Dr. BRUNTON BLAIKIE exhibited specimens of urea obtained from normal mammalian muscle freed from blood.

Professor DENYS (Louvain) brought forward experiments showing the bactericidal power of extracts of leucocytes from the marrow and the absence of such power in leucocytes of the lymph glands, &c.

Professor HEGER and Dr. DEUWOR (Brussels) contributed work upon the alterations in the morphological appearance of the neurons of the cortex of the brain brought about by anæsthetic and narcotic drugs and by the winter sleep of hibernating animals. The interesting point has been proved by Professor von Frey (Zürich) that in order to evoke a sensation of touch the larger the surface of contact the relatively more intense must be the pressure per unit of the surface of application.

Two significant experiments were shown by Professor SHERRINGTON, F.R.S. (Liverpool): (1) the striking inhibition of the tonus of the extensor muscles of the knee-joint and the consequent abolition of the knee-jerk obtained by electrically stimulating or even gently kneading the flexor muscles of the knee; and (2), in conjunction with Dr. H. E. HERING (Prague), the inhibition of various muscles of the limbs and trunk obtained by excitation of points of the cortex of the brain. It was shown for a large number of muscle groups that at least two cortical centres for each exist. From one of these contraction can be regularly elicited and from the other relaxation.

Professor HAHN (Munich) showed that by injection of extracts of cholera bacilli and of typhoid bacilli into guinea-pigs specific immunity against intra-peritoneal infection with those bacilli can be obtained.

Professor TOWNSEND PORTER (Harvard, Boston, U.S.A.) showed some remarkable experiments on the mammalian heart. The heart removed from a recently killed dog, washed clean of blood, and then supplied with defibrinated blood or even with blood serum under high pressure of oxygen recommences to beat. Even small pieces of the ventricle of the thus excised heart will go on contracting forcibly and regularly for many hours.

Dr. LEONARD HILL (London) exhibited a simple and accurate sphygmometer for recording the blood-pressure in the human radial artery. Dr. Hill also demonstrated experiments illustrating the great influence of gravity upon the circulation. He showed how by adoption of suitable postures or by use of a bath or of compression of the abdomen the dangers and ill effects can be removed. The arterial pressure is restored, the heart fills, and respiration becomes re-established.

Dr. F. G. HOPKINS (London) and Mr. W. B. HOPE detailed observations on the dietetic precursors of the uric acid of urine. They pointed out that the ascription of all uric acid production in the mammal to the disintegration of nucleins is an over-hasty conclusion.

An important addition to micro-chemistry was made by Professor MACALLUM (Toronto) in the demonstration of a new and reliable method for the detection of phosphorus in animal and vegetable cells. The tissues after being treated with molybdate of ammonia in nitric acid are acted on by phenylhydrazin hydrochloride. To prevent confusion their lecithin is previously extracted with hot alcohol. The

phosphorus compounds give a dark-green reaction. The method reveals phosphorus in the chromatin of all nuclei, in all nucleoli, in the zyanogen granules of pancreatic cells, in the colloid material of the thyroid and in the outer limbs of the rods and cones of the retina.

Professor WALLER, F.R.S., brought forward the continuation of his work on the influence of salts on the electro-mobility of nerve fibres. The predominant moiety of a salt in its action upon nerve is the basic or electro-positive element—e.g., any potassium salt is more effective than any sodium salt.

Dr. BUDGETT (St. Louis, U.S.A.) communicated experiments on the physical absorption of salt solutions by egg-membranes.

Professor VITZOU (Bucharest) reported experiments showing the existence of visual power in the monkey after total ablation of both the occipital lobes of the brain. The effect of injection of neurin and allied substances upon the circulation was shown by Professor HALLIBURTON, F.R.S., and Dr. MOTT, F.R.S., in prosecution of their research upon toxic substances occurring in certain classes of diseases of the central nervous system.

Dr. LEE (New York) showed that of the two supposed causes of muscle-fatigue—viz., decrease of contractile substance and accumulation of fatigue products with poisoning of the muscle thereby—the former plays no part, the latter being the sole factor. His attempts to demonstrate histological differences between resting and fatigued muscle had given only negative results.

An excellent demonstration of the electric changes in the phrenic nerve which accompany its normal periodic activity was given by Professor WAYMOUTH REID, F.R.S. (Dundee), and Dr. J. MACDONALD.

Professor BÉDART (Lille) reported on the production of a flow of secretion from the mammary glands by electrification of the skin over the gland.

Mr. LANGLEY (Cambridge) showed a cat the end of the vagus nerve of which had been joined to the sympathetic nerve 64 days ago. Both nerves had been ligatured with horsehair and 1 in. of the nerves above the ligature carefully excised. The central end of the vagus was then turned forward to lie in contact with the peripheral end of the cervical sympathetic. At the meeting the vagus was cut near the skull and its peripheral end stimulated, when all present could plainly see that a regeneration had taken place, the eye opened, the nictitating membrane retracted, the pupil dilated, and there were in short produced the ordinary effects of stimulating the cervical sympathetic. This experiment proves that fibres of nerves can be diverted for other purposes and vaso-dilators be converted into vaso-constrictors. During the experiment an injection of nicotin prevented the vagus but not the superior cervical ganglion from acting.

Professor MAREY (Paris) pleaded the need of an international commission to unify and control recording physiological instruments such as manometers, myographs, sphygmographs, &c., in order to bring results up to the uniform standard which has been accepted in physics.

Professor HEYMANS (Gand) showed that various organic substances of the sulphur group can prevent or cure poisoning produced by fatal doses of nitryls and cyanides. A rabbit injected with the antidote and immediately afterwards with the poison remained lively and well, while a control rabbit without the antidote was killed in half an hour, and a third rabbit which received the same dose of poison without the antidote was reduced to a moribund state and brought back to life again by a dose of the antidote.

Professor SCHÄFER (London) gave a valuable account of his experiments on the alleged sensory functions of the motor cortex cerebri of the monkey. He has made 30 experiments upon the area connected with movements of the face, the leg, combined arm and leg, and upon the gyrus fornicatus. An important point noticed in the face area observations is that, although the cheek-pouch was paralysed and became filled with food, the animal was conscious of its presence and occasionally emptied it by pressing it against the shoulder or by forcing the contents out with the hand. Some of the monkeys were shown to the Neurological Society and were tested by several of its members a year ago. The result, in short, shows that complete voluntary motor paralysis of a part may be produced by a cortical lesion without perceptible loss of tactile sensibility. It cannot, therefore, be the case that the motor paralysis which is produced by a lesion of the Rolandic area is due to a sensory disturbance. And it also follows that tactile sensibility is not localised in the same part of the cortex from which voluntary motor impulses directly emanate. Hemianæsthesia sometimes results from an extensive lesion of the motor cortex; this is, however, not local but general, and is due to the vascular and mechanical disturbance produced upon the whole side of the brain by the establishment of the lesion. That this is the case is shown by the fact that it is generally accompanied by hemiopia, though in none of the experiments was the visual cortical area directly involved in the lesion. Five monkeys were operated on in this way: having exposed the upper Rolandic region the leg area in the gyrus marginalis was completely severed by a cut passing as far down as the calloso-marginal sulcus and deep enough to sever all the fibres passing from the cortex to the centrum ovale. In no case did the lesion produce anything more than a temporary sensory disturbance; the opposite leg was always completely paralysed, although after a time "associated movements" returned. This tends to show that the hemianæsthesia of former operations must have been correlated with disturbance of some part of the cortex other than the motor region and was probably indicative of a general disturbance of the whole hemisphere, involving perhaps the thalamus.

Professor BOWDITCH (Harvard) begged members to sign a protest in favour of the moderate use of alcohol to counteract the efforts of too zealous teetotallers in America who had persuaded the Government to introduce into schools and school-books the doctrine that alcohol is a poisonous substance which can only do harm and never do good to the human body.

Professor BOYCE (Liverpool) read a paper illustrated with many lantern slides on the Central Nervous System of Birds. Two constant physiological movements are obtained by stimulating the surface of their hemispheres—viz., contraction of the opposite pupil from stimulation about the middle of the mesial wall, and rotation of the head and neck and deglutition from stimulation of a small area on the lateral aspect. By removing the anterior or posterior portion of the cerebral hemisphere marked deficiency of vision in the opposite eye is caused but no kind of motor defect. If the injury be to one optic vesicle marked partial blindness in the opposite eye occurs, and if injury be very severe the bird becomes unable to stand and lies on its back continually. If both central hemispheres are destroyed the bird is very inert, does not peck corn and must be fed, does not pay any attention to objects moved in front of its eyes, but in walking avoids obstacles and obtains some support in the air by its wings, but cannot fly properly. To show how completely the brain is an optic organ absolute blindness could never be produced, for the acerebral pigeon avoids obstacles, and this is the case also when, together with removal of one hemisphere and consequent blindness on the opposite side, the eye of the same side is enucleated.

Professor KRONECKER (Berne) read several papers for himself and others, of which want of space forbids further mention.

The five physiologists chosen by the University to receive the honorary degree of Doctor of Science were Bowditch, "from the other Cambridge," known for his work on heart, muscle, nerves, &c.; Golgi (Pavia), renowned for his interest in malaria; Kronecker (Berne) and Marey (Paris), both of whom have adapted many physical instruments to physiology; and Kühne of Heidelberg whose labours are known in connexion with nerves and muscles.

The Public Orator employed the modern pronunciation of Latin, but our medical colleague the Vice-Chancellor was loyal to the English methods. Great credit is due to the president, committee, and honorary secretaries for making the meeting a great success. The only unfriendly criticism made was that the exhibition of instruments and apparatus was a very poor one. The evening entertainments were shared by the zoologists, which made a pleasant variation. They consisted of a reception by the mayor, a *fête champêtre* given by the Vice-Chancellor at Downing College, a conversazione in the Fitzwilliam Museum, a garden party in the botanical gardens and a subscription banquet. At the final meeting grateful thanks were accorded to all the kind hosts. The great feature of the Cambridge congress for most of the visitors was that they were nearly all housed in Trinity, Trinity Hall and Caius colleges, and they were allowed to obtain an intimate insight into the inner life of the Cambridge dons.

At the final session of the Congress it was resolved that

the next meeting (1901) should be held at Turin under the presidency of Professor Mosso. The following were elected to act as an organising committee:—Professor Bohr (Copenhagen), Professor Bowditch (Boston, U.S.A.), Professor Dastre (Paris), Professor Foster (Cambridge), Professor Fredericq (Liège), Professor Grützer (Tübingen), Professor Kronecker (Bern), Professor Kühne (Heidelberg), Professor Mosso (Turin), Professor Sherrington (Liverpool), and Professor Wedenskij (St. Petersburg).

NOTES FROM INDIA.

(FROM OUR SPECIAL CORRESPONDENT.)

Fresh Increase of Plague.—Postponement of the Great Improvement Scheme for Bombay.—Inoculation and Vaccination.—More Regulations about Plague.

THE increasing death-rate from plague in Bombay city seems to foreshadow the early occurrence of a third outbreak. 85 deaths from plague have been registered during the past week—an increase of 23 on the previous record. The almost entire absence of cholera is still a remarkable feature in the returns. While last year the returns of plague were probably under-estimated in consequence of the concealment of cases there is reason to believe that under the present system of administration all the cases are recorded. In Calcutta it has been feared for some time past that cases of plague have been concealed. As the total mortality, however, has been small the unreported cases must have been very few. The discovery of two natives dead and two more in a dying state in one house on August 10th gives proof of this concealment. The disease is increasing in the Deccan. As many as 90 fresh cases and 62 deaths were reported at Hubli for August 8th. In the Bhore State also it is increasing. It is hardly likely that Poona will escape another visitation and already some suspicious cases have been discovered at Poona station.

The indefinite postponement of the great improvement scheme for Bombay has caused great disappointment. At one time the matter was put forward as one of great urgency and promised an early prospect of its fulfilment. Rumour has it that jealousy is the cause of this urgent and great reform in the western city being postponed. It might seem childish to English minds to suggest that such an influence could prevail, but those who know India best say that it is not only possible but probable. The third reading of the Bill was taken in April and while numerous references have been made in matters of detail it still requires the final sanction, and the final sanction does not come.

No further results have been proclaimed about "curative" serum. Prophylactic inoculation proceeds but slowly. It is unknown how long the partial protection lasts—in all probability but a few months. A few experiments on animals would afford some clue on this point, but nothing seems to have been done. Being merely a temporary toxin poisoning there is of course no comparison with vaccination. The latter practice was carried out in Bombay to the extent of 34 per cent. Considering the difficulties of registration it shows that in India at any rate the people have learnt to place confidence in its value. It is to be hoped at any rate that the Eastern mind will not require a clause to satisfy its conscience. Amongst the unvaccinated emigrants, chiefly from Africa, small-pox is most terrible.

The vacillation of the Government with respect to plague administration is again shown by the issue of a fresh series of regulations, dated August 12th, giving special powers and directions to the Municipal Commissioner of Bombay. It will be remembered that after the riots all coercive measures were suspended and that practically from that date little was done except house cleansing and disinfection. Now, however, the removal to hospital of persons suffering from plague is re-enacted. Powers are given to a specially appointed Deputy-Commissioner to inspect and have cleansed any insanitary buildings, to take such measures as he shall think fit where any dangerous disease is suspected to exist in order to prevent its spread, to close any well or tank the water of which is likely to cause the spread of any dangerous disease, and to have destroyed any hut or shed, bedding, clothing, or other articles likely to spread disease. The new regulations are, in fact, a re-instatement of the powers of the late Plague Committee. A special medical officer is appointed for plague operations. It is too soon perhaps to calculate upon the effect of such measures. Suffice it to say that if they be carried out with the strictness of the previous authorities more troubles may be anticipated.

August 13th.

The Bombay Improvement Scheme.—The Milk-supply of Bombay.—Death of Dr. K. N. Bahadurji.—The Plague and Typhoid Fever in India.

The Act for the great Bombay Improvement Scheme has at last received the final sanction, so that there is no cause why the structural improvement of Bombay should not be commenced at once. While the great alterations proposed will improve the city in many ways it must not be imagined that it will make Bombay a healthy city or have any effect on the plague. The conditions of existence of the great mass of the natives are such that only radical building Acts, housing Acts, and almost universal alteration of drainage arrangements could improve their state of health. Bombay will be beautified, communications between one part of the city and another will be facilitated, the streets will be opened out, and "artisans dwellings" constructed for a certain number of the people, but these things, while comprising immense improvements, will not strike at the inner unhealthy life of the people. In THE LANCET of Feb. 26th the state in which hundreds of thousands of people live in the crowded parts of Bombay was described. Perhaps the most crying evil is the overcrowding and the general want of ventilation in the dwellings. One effect of this is the extremely high death-rate from phthisis. It must be admitted that to put a large and overcrowded Indian city on a proper sanitary footing and to adapt the principles of western civilisation to the circumstances of this country is an almost impossible undertaking. At any rate, a sanitary miracle cannot be performed, so that it is necessary to remind enthusiasts that improvement of the public health must necessarily be slow and that they must be satisfied with the prospective advantages in many years to come.

The milk-supply of Bombay is another matter which requires urgent attention. It is obvious that the dairies and cattle-sheds should be subject to rules and regulations the breach of which should be punishable, and that they should be periodically visited by competent inspectors. At present this is far from being the case, the cattle for the most part being housed and kept in a most filthy state. There is not sufficient protection against dirt and there is practically none against fraud. These strictures do not apply to one or two well-managed dairies, but the great mass of the milk-supply is open to this condemnation.

I record with much regret the death, at the early age of thirty-eight years, of Dr. K. N. Bahadurji, the leading Parsee practitioner in Bombay. He was a M.D. Lond. and well-known for his advocacy of certain medical reforms, more especially the grievances of native medical graduates.

Whilst typhoid fever is so common and so fatal amongst the British in India it has been asserted that from this disease the natives are free. On the other hand it has been argued that being common amongst young children it is in consequence not often seen amongst the adult population. From cases I have seen I believe there is an explanation for these apparently contradictory statements. In the first place the bowel symptoms in natives suffering from typhoid fever are but slightly marked, so it is probable that the general symptoms existing alone have caused it to be confounded with other diseases. It is generally admitted that there are a large class of fevers in India in which it is almost impossible to make an exact differentiation. These two facts explain the absence of a correct diagnosis in a very large number of cases. In the second place typhoid fever is not so fatal among the native population and when the patient succumbs it is more frequently due to what is apparently a complication. The illness is therefore often probably recorded as a local disease although accompanied by a general fever. The essential point of difference, however, lies in the comparatively slight abdominal symptoms. If these statements be confirmed they will explain why it is that typhoid fever has not hitherto been recognised as common amongst the native population. I have reason to believe that at the present time typhoid fever is prevalent in Bombay, that many of the deaths returned as from "fever" are due to this cause, and that the prevailing diarrhœa has a similar origin. At the same time the total

deaths from fever are considerably below the average of previous years.

In view of the possibility that plague will become epidemic in Calcutta during the colder season elaborate precautions are being taken by the authorities. The health officer has granted licences for 974 ward, family, and caste hospitals. They are divided thus: family hospitals, 957; ward hospitals, 11; and caste hospitals, 6. The reported mortality from plague in Calcutta up to date is over 150. Outside the Bombay Presidency Calcutta is the only place affected, though an isolated case has been reported from the Punjab and 2 imported cases in Madras. In the Bombay Presidency, Bombay City and Belgaum, Dharwar, Surat and Thana districts are most affected. In Bombay City 101 deaths from plague were registered during the past week. Relapsing fever still continues, 16 deaths having been recorded. The mean death-rate for Bombay in the month of August is about 40 per 1000; at the present time it is 44·4 per 1000.

August 20th.

BIRMINGHAM.

(FROM OUR OWN CORRESPONDENT.)

Deaths under Anæsthetics.

TWO instances of death during the administration of anæsthetics have lately occurred in this neighbourhood. One was that of a boy, aged fifteen years, who died on August 10th at Redditch when chloroform was given for an operation on a diseased hip. In this case Dr. Page, who gave the chloroform with a modification of Junker's inhaler, stated that the amount given was 80 minims, the operation lasting 25 minutes. The deceased was a fragile, delicate boy, but examination beforehand showed no contra-indication to the use of chloroform. The post-mortem examination showed no unusual signs, the heart being natural but contracted. A verdict of "Death from syncope following the administration of chloroform" was recorded. The second case occurred at the Queen's Hospital on August 24th. The patient was a woman, aged thirty-nine years, the subject of cancer. An abdominal section was about to be performed but the patient died before it was commenced. Here the anæsthetic was chloroform and ether in mixture and was given by one of the house surgeons. Preliminary examination failed to find any abnormality in the heart. At a post-mortem examination it was found to be fatty and flabby. A verdict of "Death while under an anæsthetic properly administered" was given, the cause being attributed to syncope and heart failure.

The Viewing of Bodies at Inquests.

This well-worn subject was the occasion of some remarks from the coroner for the city (Mr. I. Bradley) at his court on August 17th. The question has apparently not been definitely settled whether the viewing of the body at an inquest is obligatory or not. The Home Secretary has not expressed himself authoritatively upon the matter. No doubt the primary object of the viewing was to assist at the inquest in the detection of crime—to find out when and where and by what means the deceased came to his death—"of whose body you shall have the view." The perfunctory way in which the viewing is performed and the distaste it occasions, particularly during the recent hot weather, has been the subject of much animadversion on the part of jurors. As long as the law remains so wanting in precision of interpretation in this direction it cannot be a matter of surprise that this repugnant duty causes so much disgust among those whose duty calls them to fulfil the privileges of citizenship.

August 30th.

MANCHESTER.

(FROM OUR OWN CORRESPONDENT.)

Henshaw's Blind Asylum and the Guardians.

THE quarterly meeting of the old and valuable institution well known in the Manchester district as Henshaw's Blind Asylum was held the other week. Mr. S. L. Helm in moving the adoption of the report said that at present there were 193 inmates—62 men, 44 boys, 44 women, and 43 girls. All but 4 of them had had summer holidays, the board providing funds for 48 who had no means of their own. For many of the blind a home is provided for life. Three of the oldest inmates died during the last quarter, one of whom was admitted in 1845, another in 1849, and the third in 1865. They are taught various occupations enabling many of them to earn their own living and to return to their friends. The Manchester guardians have hitherto subscribed 5 guineas a year to the asylum, in return for which they became governors and had the power of nominating candidates for admission. There are at present several inmates nominated by the guardians, for whom a charge of from 4*s.* to 6*s.* a week is made, but even the larger sum does not meet the cost incurred in their support. Now, however, according to the newspaper reports, the guardians have decided to withhold their subscription. Under these circumstances Mr. Helm said it would be his duty to bring the matter before the board of management in order that they might consider the propriety of raising the weekly charge for these inmates to recoup themselves for the loss of the 5 guineas. The guardians would no doubt be charged the rate asked from others. They could withdraw their nominees, "but as the institution was usually full, and there were at present a number of candidates waiting for admission, that was not a matter with regard to which the board of governors need feel immediate concern." He said they could not allow the institution to suffer through the action of the guardians. The asylum is a voluntary institution and "by no means compelled to find room for the candidates sent by the guardians." It will be unfortunate if there should be any misunderstanding between the asylum and the guardians, for the latter will have a serious undertaking before them if they are to maintain, instruct, and educate their nominees in the various occupations open to the blind as thoroughly and efficiently as is now done at the asylum. They have neither the special skill acquired by long experience nor the necessary appliances, nor will their nominees escape from the tainted social atmosphere of the workhouse.

Enlargement of Monsall Fever Hospital.

The City Council of Manchester having applied to the Local Government Board for sanction to borrow £27,500 for the alteration and enlargement of the Monsall Hospital, an inquiry was held in the town-hall on August 23rd by Mr. W. W. E. Fletcher, M.B. It may be remembered that the hospital was recently taken over by the Corporation from the Infirmary. It is used for the various infectious diseases exclusive of small-pox, which will be treated elsewhere. At present neighbouring outside authorities send cases to the hospital for so much per head, but this arrangement will terminate on June 24th next, after which date it will be used exclusively as a Manchester hospital. Thirty acres of additional land are to be utilised. The inspector said that if separate accommodation were provided for small-pox cases he did not see that there would be any difficulty with regard to granting the corporation's application.

Open Spaces for Manchester.

The Lord Mayor on August 26th formally opened a recreation ground presented by Mr. F. E. Loyd to the residents of Cheetham. Plots are reserved for bowls and lawn-tennis, and a playground is set apart for children. The Lord Mayor said it was the thirty-eighth park or open space under the control of the Parks Committee, and claimed that Manchester was as well off for parks as any city in the kingdom. The *Manchester Guardian*, however, took him to task the next day, saying that there is scarcely any great city worse off, a proposition which unfortunately can be sustained by figures. Two years ago it pointed out that Glasgow had 817 acres of open space for public recreation, Liverpool nearly 700 acres, Birmingham 450 acres, Leeds a single park of more than 400 acres besides smaller parks and recreation grounds, while Manchester had only 312 acres. Some few acres have been added since, but there is still plenty of opportunity for wealthy citizens to give some brightness to the depressing life of the crowded population by adding to the scanty area of open spaces in the city. Nor is Manchester, as the Lord Mayor said, one of the healthiest of cities. The death-rate, though lower than it was, is still high, and while the suburbs are fairly healthy the average is made up by the appalling death-rate of some of its poorest quarters, which, as the *Manchester Guardian* says, "disgraces the city." It must in fairness be said, however, that we are reaping the fruits of municipal ignorance and neglect in years gone by and that earnest and

intelligent efforts are now made to remedy the mischief caused by old errors.

Unsound Meat.

At the Salford police-court on August 26th Messrs. Reid Brothers, potted meat manufacturers, were summoned for having unsound meat on their premises. On August 4th a cart in the yard contained the heads of sixty-four beasts "unsound and stinking," and in a storehouse were eighteen tongues also unsound. The two defendants were fined £20 each and costs and also £3 3*s.* extra costs.

Aug. 30th.

LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

The Liverpool City Hospitals: Contemplated Extensions.

THE members of the Port Sanitary and Hospitals Committee of the City Council made their annual inspection of the several infectious diseases hospitals under corporate management on Sept. 2nd. The Fazakerley site was the first to be visited. The site was acquired by the committee at a cost of £37,000 as a safeguard against the dislodgment of the Parkhill Hospital, which is let to the corporation by the Mersey Docks and Harbour Board, and which it is possible may be required by the latter body. The site consists of 113 acres and will accommodate 300 beds, 80 more than are provided at the Parkhill Hospital. The party then proceeded to visit the offices of the Port Sanitary staff at the pier-head, thence proceeding to the Grafton-street and Parkhill Hospitals. The Grafton-street institution is probably one of the most complete of its kind in the kingdom. Extensions are in contemplation at Mill-lane, Old Swan, at a cost of £40,000, where it is proposed to erect two pavilions to contain 80 beds. As time goes on the committee will be enabled to deal with all acute cases of infectious diseases and to draft convalescent cases to Fazakerley. The chairman, Dr. Thomas Clarke, pointed out that with regard to small-pox the new Vaccination Act did not accord with the views of the committee, as in a limited time unvaccinated cases would probably predominate. That was one of the strongest arguments which could be used in favour of the erection of additional small-pox hospital accommodation. Dr. Hope pointed out that the parish of Liverpool was the most extensively vaccinated parish in England. The latest published returns showed that only 4 per cent. of children born in Liverpool were not accounted for in regard to vaccination. In West Derby the rate was 7 per cent. and in Toxteth Park about 9 per cent. The members of the committee sat down to luncheon at the Parkhill Hospital, which was presided over by Dr. Thomas Clarke, the chairman of the Committee.

The Purity of the Liverpool Water-supply.

It is satisfactory to know that the Vyrnwy water is not "particularly rich in typhoid germs" as was asserted by a speaker at a recent meeting of the Chester Waterworks Company. Dr. Hope, the medical officer of health of Liverpool, informed the Water Committee of the Liverpool City Council that all the reports made by Professor Boyce during the past twelve months proved that the Vyrnwy water was of exceptional purity and not a typhoid organism or anything allied to it had ever been found in it. The members of the committee expressed themselves quite satisfied that the statement was absolutely without foundation and that Liverpool was very fortunate in having such a wholesome water-supply.

Death of Mr. John Wallace, M.D., L.R.C.S. Edin.

The death of Dr. John Wallace, the Professor of Midwifery at University College, Liverpool, and consulting gynæcological surgeon to the Liverpool Royal Infirmary, took place on Sept. 1st from an attack of gastritis. Dr. Wallace had only been confined to the house for a few days, his death being so unexpected that the wedding of his son, Dr. Arthur J. Wallace, which was fixed for Sept. 1st, was not postponed. However, during the evening of Sept. 1st, an attack of hæmatemesis supervened, causing so much prostration that Dr. Wallace succumbed before midnight. Dr. Wallace graduated as Doctor of Medicine at the University of Edinburgh in 1861, having been a pupil of the late Sir James Y. Simpson. He settled in Liverpool nearly thirty years ago and devoted himself to obstetric practice. Prior to the foundation of University College, Liverpool, Dr. Wallace was lecturer on midwifery at the old Liverpool School of Medicine and afterwards became its professor at University College. In 1878 he was appointed gynæcological surgeon to the Thornton Wards of the Liverpool Royal Infirmary upon the death of the late Mr. A. B. Steele, the first gynæcologist, which he resigned at the last annual meeting, having attained the limit of age of sixty years. He was thereupon appointed consulting gynæcological surgeon. He was also an examiner in obstetric medicine at the Victoria University and a past president of the North of England Obstetric and Gynæcological Society. Dr. Wallace leaves three sons and two daughters; his eldest son, Dr. Arthur J. Wallace, is the assistant lecturer and demonstrator in midwifery and gynæcology at University College, Liverpool. The remains were cremated at Anfield Cemetery on Sept. 5th, prior to which a funeral service was held at St. Andrew's Church, Rodney-street, which was attended by a large number of Dr. Wallace's former colleagues and other friends.

The New Vaccination Act: the First Case in Liverpool.

The first "conscientious objector" to the practice of vaccination appeared at the Liverpool Police-court before Mr. Kinghorn, the deputy stipendiary magistrate, a few days ago. The applicant, a young married man, aged twenty-three years, applied for a certificate of exemption on the grounds that he "did not believe, never did believe, and never will believe in vaccination." Mr. Kinghorn naively remarked that he thought under the circumstances the young man was hopeless, a remark which excited laughter in court. The magistrate, assuming the young man's objections to be conscientious, and having, as he said, no means of testing his *bona fides*, granted a certificate of exemption. Evidently Mr. Kinghorn felt his position an embarrassing one as regards the means of testing the conscience of the "conscientious objector."

Closing of a Liverpool Cemetery.

The Necropolis, one of the oldest and largest of the remaining intra-mural cemeteries, has been closed under the powers of the Liverpool Improvement Act, 1898, which provides for the acquisition and closing of a number of old burial grounds in the city. The city council has paid £3800 to the proprietors of the cemetery in compensation. A number of small burial grounds have also been closed under the same Act.

The Liverpool School Board and the Scholars' Eyesight.

The Liverpool School Board have arranged for a series of three lectures with demonstrations to be given to head and assistant teachers with regard to the best methods of ascertaining defects in the children's eyesight. The first lecture was delivered on Sept. 5th in the Arts Theatre of University College, Liverpool, by Mr. R. J. Hamilton. The periodical examination of the eyesight of school-children is a step in the right direction and will prove beneficial to them. The board are anxious that the teachers should avail themselves of the opportunity afforded to them by means of these demonstrations.

Charge against a Military Officer of Aiding in Procuring Abortion.

Mr. Sampson, the city coroner, held an inquest on August 29th touching the death of Miss Jane Yates, a young woman, aged twenty-nine years, who died on July 27th under suspicious circumstances. The medical evidence went to show that the patient died from septicæmia the result of a miscarriage. The post-mortem examination revealed evidences of septic peritonitis and a shallow abrasion on the posterior side of the uterus. Mr. F. T. Paul stated that in his opinion the miscarriage was due to the use of one of the catheters produced in court. The jury returned a verdict that Miss Yates's death was caused through procuring abortion and that Lieutenant Wark was privy to the act. As the verdict was equivalent to one of murder Lieutenant Wark was placed under arrest and was committed to the Assizes under the coroner's warrant.

Sept. 7th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

University of Glasgow: Memorial Window in Honour of Principal Caird.

ON the initiative of the Business Committee of the University General Council a movement has been set on foot to place a painted glass window in the Bute Hall of the University as a special tribute by past and present students of the University of Glasgow to the memory of its late distinguished head. The idea is a most appropriate one and has only to be made known to be completely successful. Already many old *alumni* of the University in various parts of the country have sent in contributions. It is estimated that the undertaking will require about £1000 and the maximum subscription is £1 1*s*. As there are many former students of the University whom it is obviously impossible to communicate with from any lists at present available the coöperation of all interested in making the movement known among students of older date is invited. The secretaries are Mr. John G. Kerr, M.A. (Convener of the Business Committee of the University General Council), and the Rev. Arthur Stanley Middleton, M.A. (President of the Students' Representative Council). Mr. Archibald Craig, 158, St. Vincent-street, Glasgow, is treasurer.

Hospitals in Aberdeen.

Intimation having been made by the directors of the Royal Infirmary that they could not see their way to take any more cases of erysipelas into the infirmary the Town Council's Hospital Committee has agreed to admit such cases to the City Hospital, where a ward will be set apart for the purpose. The action of the infirmary directors is probably not unconnected with the fact that for the first seven months of this year there has been a deficit in the finances of £1300. The directors of the infirmary have appealed to the life managers and the public generally for larger subscriptions so as to meet the expenses of the enlarged institution and the increased number of patients. A similar appeal has been issued on behalf of the new convalescent hospital at Pitfodels in the suburbs of the city. For each contribution of one guinea per annum subscribers will have the right to nominate for a week's residence one patient, whether previously treated in the infirmary or not.

Horseplay at the Glasgow Royal Infirmary.

On Wednesday morning last, at the St. Rollox Police-court, Glasgow, ten of the junior staff of the Glasgow Royal Infirmary and two other persons were fined 1 guinea each with the alternative of fourteen days' imprisonment for having ducked another resident in a bath. The cowardice of this combination of twelve persons to do physical violence to one will strike all who hear of the matter. Members of the medical profession who attain to responsible posts in our large hospitals are supposed to have learnt to behave themselves, so that the rough horseplay which these young fellows indulged in was decidedly out of keeping with their positions.

Sept. 5th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Typhoid Fever in Strabane.

AT the weekly meeting of the Strabane Board of Guardians, held on August 23rd, it was reported that there were 11 cases of typhoid fever in the Fever Hospital, and 3 other cases were also reported. The Local Government Board have requested Dr. Trimble, medical officer of the Strabane Dispensary District, to let them know the probable source of infection in each case of typhoid fever and scarlet fever which has recently occurred in Strabane.

Nursing in Castleblaney Workhouse.

At an inquest held at the workhouse, Castleblaney, on August 24th, on an inmate of the workhouse infirmary, it was stated in evidence that the deceased was one of about 75 patients in the hospital and infirm wards—24 in hospital, the remainder infirm—who are attended by one nurse and one untrained assistant. These have the care of eight and sometimes of ten wards, and have in addition to the nursing to superintend the washing and serving of food to the inmates of these wards. Dr. Wilson, the medical officer of the workhouse, said in his examination that it was a physical impossibility for the nurse and her assistant to pay proper attention to the sick in the hospital. It appears that the guardians have not carried out the recent requirements of the Local Government Board who called upon them to appoint an efficient staff of nurses to pay proper attention to the sick and infirm. Perhaps the rider added by the jury to their verdict, in which they recommend the Local Government Board to see that an efficient staff of nurses is appointed in the hospital to look after the sick, will have some effect on the guardians.

Bangor District Nursing Society.

At the first annual meeting of this society, held in Bangor on August 23rd, the Marquis of Dufferin presided, and the annual report was submitted by the Marchioness of Dufferin. It would appear that in Bangor trained nursing of the sick poor began on May 24th, the Queen's Birthday, and in commemoration of the Diamond Jubilee. The donations to the society were £89 and the annual subscriptions were £74. The district embraced by the nurse extends for two miles in every direction from the centre of Bangor and her nursing is entirely unsectarian. She had looked after 144 cases during the year and paid 3017 visits. The noble chairman intimated that during the coming year he would deliver a lecture on behalf of the funds of the society.

Belfast Water-supply.

The Belfast Water Commissioners, recognising the vast and increasing population of Belfast, are pushing on their new scheme by which they propose, at a cost of £850,000, to bring the water from the Silent Valley—a huge table-land immediately over Kilkeel, co. Down—a distance of 45 miles. Recently the Commissioners spent two days in inspecting the entire length of route. They first visited the service reservoir situated about five miles from Belfast, near Knockbracken, and found it in a wonderfully forward condition; it is to cost £34,000. They then inspected the conduit from the reservoir to Ballynahinch. It includes a considerable amount of "cut-and-cover" and a tunnel of more than 2¼ miles. This is almost finished and this contract is for £145,000. The next part of the conduit is principally "cut-and-cover" and will cost £45,000. The Commissioners then visited what is a very difficult part of the work, as it includes in addition to 2 miles of "cut and cover" the very laborious task of boring a tunnel 2¼ miles long through the highest of the Mourne range of mountains, Slieve Donard, as well as 7¼ miles of cast-iron and steel syphon pipes. The contract for this is £96,000. On the far side of Slieve Donard, that is, between it and the Silent Valley, the conduit is principally "cut and cover" and will cost £115,000. The Silent Valley, situated 500 feet above sea level, is a most suitable district for a reservoir and catchment area, but it is not contemplated for the present to build a reservoir here, as the supply of water from two rivers—the Kilkeel and Annalong—will for some years to come be sufficient without a reservoir, and the Commissioners have the right to tap these rivers. The work on this gigantic undertaking will probably not be finished for two more years. Then the citizens will have a never-failing supply of water which experts, after examination, declare to be equal to that of Loch Katrine, which supplies Glasgow.

Report of the President of Queen's College, Cork.

The annual report of the president of Queen's College, Cork, has been issued. It refers to the appointment of a lecturer on Celtic and considers there ought to be a chair for such an important subject, especially as comparative philology is receiving so much attention on the Continent at present. The president makes reference to many subjects concerning the medical school. The new pathological laboratory has been completed and is ready for the summer course of practical pathology. There have been very considerable improvements made in the medical department. A splendid collection of frozen sections of the human body has been obtained from Berlin and will shortly be placed in the dissecting-room. Many of these by a new arrangement will be visible on both sides. An excellent set of the newest kind of diagrams has been procured for the anatomical and physiological departments. Models of the viscera and other parts of the body have also been obtained and will be also placed in glass cases in the dissecting-room.

There are already several instructive dissections in the anatomical museum. It is proposed to place these in the dissecting-room with models in cases. When these changes have been made the dissecting-room will be well-furnished according to modern ideas. The president deals tentatively with the education question generally and urges on the Government the desirability of founding a University in Cork. In that connexion he alludes to "the extraordinary and quite exceptional ability of the people of the South of Ireland and particularly of those who inhabit the counties of Cork and Kerry." He directs attention to the very large sums provided by the State in various parts of Germany for the development of the national universities, and suggests that if our Government were to devote the same attention to the fostering of higher education in Ireland this country, like Germany, would rapidly attain a high position side by side with England amongst the commercial nations of Europe.

Sept. 7th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Pulmonary Streptococcus Infection.

THE meetings of the Academy of Medicine are but sparsely attended at present owing to the holidays, but at the meeting held on August 15th M. Clozier reported a very interesting case of what at first appeared to be acute pulmonary tuberculosis. The illness, however, was due to streptococcus infection and was cured by the use of Marmorek's serum. The patient, a boy aged thirteen years, had previously been in good health and there was nothing of note in either his personal or his family history. After coming in from a bicycle ride in the rain he was seized with shivering, his temperature ran up, and he had a cough. Auscultation revealed small crepitations over the whole of both lungs. The sputa, which were muco-purulent, contained none of Koch's bacilli but plenty of streptococci. His condition became more and more serious despite free stimulation and active revulsive treatment. At last he was given a hypodermic injection of 20 c.c. of antistreptococcic serum followed by an injection of 10 c.c. for the next three days. He continued to get worse and there were heard on auscultation tubular breathing, large bubbling râles and pectoriloquy. The three following days the dose of serum was increased to 20 c.c. Finally, three days later than this a pulmonary abscess lying at about the angle of the scapula emptied itself and all the signs of a cavity became audible. One more injection was given and from that time rapid convalescence ensued.

Agglutination in Tuberculous Serum.

At a recent meeting of the Academy of Sciences, a body whose work is less affected by the dull season than that of the other societies, M. S. Arloing and M. P. Courmont read a paper on the best methods of cultivating the bacillus of tuberculosis so as to obtain the agglutinative reaction in a neat and really convincing manner. The culture medium is beef or veal bouillon peptonised 1 in 100 and glycerinated to a strength of 6 in 100. Plain bouillon does not further the growth of the agglutinative material, whatever be the bacillary strength of the cultures, although agglutination sometimes occurs under such circumstances in a very defective manner. The proportion of glycerine is a percentage of from 2 to 12, but the most convenient proportion for bringing about the agglutinative action is a percentage of from 2 to 8. In a culture glycerinated to 6 or 8 per cent. serum manifests an agglutinative power twice as strong as a culture only glycerinated to 2 per cent. Peptone is also indispensable for a good growth. In a bouillon glycerinated but not peptonised the culture is no richer at the end of ten days than in a peptonised bouillon at the end of three. The bouillon must be sterilised by being heated for as short a space of time as possible to a temperature of 110° C. Homogeneity is obtained by frequently shaking the cultures, which are made for this purpose in cylindrical flat-bottomed flasks. Rich cultures of from eight to ten days old are the best for obtaining the agglutinative reaction. In many cultures the agglutinative substance is found to increase up to the fifteenth day, but after that date it diminishes or gets weaker. It is best to work with weak serums and cultures.

Radiography and the Physiology of the Heart.

M. Bouchard at a recent meeting of the Academy of Sciences reported some observations he had made upon the thoracic organs by means of the x rays. Amongst other things he has been enabled to assert the existence of a marked dilatation of the auricles when the intra-thoracic blood-pressure is raised during inspiration. This condition is artificially brought about by endeavouring to inspire with the glottis shut and is naturally brought about by the violent inspirations during a paroxysm of whooping-cough. M. Bouchard has also discovered that a clear horizontal space exists during forced inspiration between the shadow of the heart and that of the diaphragm, but during normal inspiration there is no space visible. This phenomenon, which is remarkable considering that the diaphragm and the pericardium are attached to one another, is explained by M. Bouchard in the following way. During the forced descent of the diaphragm in a large inspiration the inferior surface of the heart is in contact with the diaphragm to a very limited extent. The pericardium tucks itself into the space existing between itself and the heart, forming in front and behind a gutter into which in turn the pulmonary tissue is packed, thus forming a layer of tissue much more penetrable by the x rays than those which make up the heart and the diaphragm.

Vaccination in France.

At the Congress held at Nantes M. Brouardel proposed a resolution, which was unanimously adopted, to the effect that compulsory vaccination should be extended to Tunis. In France vaccination is enforced by strict regulations which do not meet with any opposition from the public. All persons seeking employment of any kind are required to produce a certificate of vaccination and all soldiers are revaccinated on joining their regiments. The Academy of Medicine also awards every year a considerable number of prizes and medals to the medical practitioners and midwives who have performed the most vaccinations and revaccinations. In fact, vaccination is taken quite as a matter of course in France and the arrangements for making it compulsory in the colonies are at the present time almost complete. Under these circumstances no one looked for a campaign against vaccination undertaken by the celebrated anti-Jewish journalist Edouard Drumont, a campaign undertaken in the name of individual liberty and, which is still more strange, in the name of hygiene as understood by M. Drumont. In an article which has produced some sensation and caused astonishment rather than made converts, he declares that small-pox is not a disease but a natural process, in the course of which the organism spontaneously throws off morbid products which it contained; in his opinion vaccination has no other effect than that of closing the pores of the skin and preventing the escape of the morbid products. According to M. Drumont vaccination is the only cause of racial degeneration and of the increase of new diseases which were formerly unknown; on this ground Jenner must be regarded as a scourge of humanity, although it is admitted that he possessed the merits of being an excellent father and a naturalist who carefully studied the habits of the cuckoo. In conclusion, M. Drumont draws attention to the unpopularity of vaccination in Jenner's own country. It is not very probable that the French public, whether medical or non-medical, will be influenced by these fanciful ideas.

Sept. 6th.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Plague in East Africa.

IN a paper on Bubonic Plague which was read a short time since before the Berlin Society of Public Health Professor Koch said that only a few years ago it seemed as if the disease possessed little more than a historical interest, but the recent epidemics in China and the East Indies have proved that under conditions favourable to its development it remains capable of committing great ravages. The researches of Yersin and Kitasato have shown that plague is a contagious disease produced by bacteria, and it has, moreover, been ascertained that it may be to a great extent spread by rats. It is also known that the disease is endemic in certain districts which from time to time become the starting

points of epidemics. For instance, the course of the epidemics which came from the East to Europe could be traced back to Mesopotamia and there were grounds for believing that there really was a centre there. The second point of origin is in Central Asia and the epidemics in China and India have obviously had their source there. A third centre of minor importance is situated in Assir, Western Arabia. To these three centres there must now be added a fourth which has not long been recognised. Professor Koch when in Dar-es-Salaam in German East Africa was informed that a disease was prevalent in the Kisiba district the symptoms of which were very like those of bubonic plague. He accordingly sent Dr. Zupitza, one of the colonial medical officers, to this district with instructions to make bacteriological examinations of the cases. Dr. Zupitza's report was to the effect that the clinical symptoms were those of bubonic plague and that the typical bacilli were present in the lymphatic glands and in the spleen. The disease is termed *rubwunga* by the natives, who, moreover, are aware that its germs are spread by rats, and abandon their dwellings as soon as the rats begin to die. Dr Zupitza succeeded in ascertaining the presence of bacilli in three rats. Kisiba, however, is not the real focus of the plague, for the disease was imported eight years ago from the British territory of Uganda, where the *rubwunga* has been known from time immemorial. From Kisiba the disease was carried north to Emin Pasha's provinces and to Upper Egypt. In the beginning of this century there were some small epidemics in Egypt and in the year 1870 there was one in Morocco, the origin of all of which was quite obscure, but it is now known that they were caused by caravans of slaves which had passed through the infected territory. There has hitherto been hardly any traffic between Uganda and the coast of East Africa, but when the railway from Mombassa to that country is finished this state of things will probably be altered and the permanently infected district will be brought into direct communication with the coast. There is no need for alarm on this account, for it is known from the history of plague that the disease has always retired before advancing civilisation. It may therefore be hoped that the spread of civilisation will in course of time have the effect of abolishing plague.

Professor Koch's Investigations on Malaria.

To continue his researches on malaria Professor Koch has gone to Italy accompanied by several of his assistants. The Italian Government has placed the university laboratories at his disposal and will do everything to facilitate his work. On leaving Italy he will proceed to Greece. This first journey will be of a preliminary character and will be finished within three months. Afterwards he will visit the fever districts in East Africa, India, and New Guinea and will be absent there for about two years. The expenses of the expedition will be defrayed by the German Government. Colonial medical officers before going to the tropics will attend courses of instruction at the Institute for Infectious Diseases in order to be trained in the diagnosis and treatment of tropical diseases under the special supervision of Professor Koch and his assistants.

Tuberculosis of the Kidney.

In a paper read before the Berlin Surgical Society and published in the *Deutsche Medicinische Wochenschrift* Professor Israel stated that primary tuberculosis of the kidneys is more frequent than is generally believed. In 21 cases of tuberculosis of the kidneys operated on by him there were 16 cases of primary tuberculosis, the urethra and the bladder being free from the disease. Women are more liable to be affected than men. Both kidneys were attacked in two instances, not including the acute form, which, of course, is only a symptom of acute general tuberculosis and is thus not amenable to surgical treatment. There are three different forms: the most frequent is the cavernous, originating in a caseous degeneration and usually combined with suppuration of the adipose capsule. The second form has its seat in the papilla; it is very rare and is characterised by profuse hæmaturia. The third form is the nodose condition, in which the whole kidney is occupied by numerous nodules of different sizes. Secondary tuberculosis of the bladder was observed in 43 per cent. of the cases operated on; this complication was therefore not regarded as contra-indicating operation. It is very important to ascertain the state of the patient's second kidney. In 14·3 per cent. of the cases operated on both kidneys were affected. Professor Israel is of opinion that when tuberculosis of the kidneys is combined with tuberculosis of the bladder and the genital organs both conditions originate in infection by the blood; in support of this view he mentions a case where tuberculosis of the kidneys was combined with tuberculosis of the testicle whilst the bladder remained healthy. The affection of the kidneys may be the only symptom of general tuberculosis, but on making a post-mortem examination tuberculosis of the lungs was discovered in about 50 per cent. of the cases. The patients, however, did not look like tuberculous subjects; there were among them men whose weight was 100 kilos. (220 lb.). Hæmaturia is the most important clinical symptom and in 4 out of 16 cases it was the only trouble present at the outset. Enlargement of the kidney could be ascertained by palpation in nearly all instances. Koch's bacilli were seldom found in the urine when the bladder was free from disease, but they are present in the great majority of cases of tuberculosis of the bladder. The bacilli thus, as a rule, come from the bladder and not from the kidney. The following complications were observed: perinephritic abscess, tuberculosis of the adipose capsule, tuberculous pleuritis and fistula of the colon. Fever was present in only 25 per cent. of the cases, but in tuberculosis of the bladder in 80 per cent. 21 patients were operated on and in all cases but 1 the kidney was entirely removed. 3 patients died as a result of the operation, either from shock or from affection of the second kidney; 5 died from tuberculosis after the wound had nearly healed. Of the cases with healthy bladder 6 are still alive, 1 of whom was operated on nine years ago. In the cases complicated by affection of the bladder there was obvious amelioration of the symptoms and sometimes, also, a partial healing could be recognised by examination with the cystoscope. Professor Israel concludes that in primary tuberculosis of the kidneys, either with or without implication of the bladder, an early operation is necessary; in secondary ascending tuberculosis operation should only be performed when grave symptoms have arisen or when the patient's general health is obviously suffering. Extirpation of the kidney should be the usual operation; simple nephrotomy is allowable only when both kidneys are involved and where fever caused by retention of pus makes an operation necessary.

Sept. 5th.

ROME.

(FROM OUR OWN CORRESPONDENT.)

Professor Koch's Study of Malaria.

WITH the facilities afforded him by the Premier, General Pelloux, and the coöperation of his old friend Guido Baccelli, once more Minister of Public Instruction, Professor Koch pursues his researches into the bacillus malariæ and its pathological effects with every official aid and encouragement desirable. Indeed, he has only to indicate the direction in which he wants to widen or deepen his investigations and the Government responds with sympathetic alacrity. The other day he expressed a wish to examine a number of cases of malaria perniciosa as at present prevailing in certain military hospitals and the Direzione Generale di Sanità, through the Minister of War, at once procured the opportunity required. In fact, Colonel Panara, Medical Inspector of Hospitals, was deputed by the War Office to place himself at Professor Koch's disposal till his purpose is fully carried out. The thoroughness with which the great bacteriologist is conducting his researches is eminently characteristic. Fresh from the Dark Continent, where he began his present study of malaria, and *en route* from Germany, he had barely alighted on Italian soil when he made a halt at Milan and, accompanied by his two assistants, Dr. Pfeiffer and Dr. Kossel, examined the more typical cases of the fever in the Spedale Maggiore, whence he carried away with him specimens of the malaria-infected blood. He did likewise at Pavia, and on his way to Rome made a brief stay at Florence, where he was met by Baccelli, and lost no time in availing himself of the clinical opportunities afforded by that school. His sojourn in the Eternal City will be prolonged till the third week in September or even later, and I believe he will extend the area of his researches so as to include the Neapolitan Riviera before completing the study to which the medical

world is now looking for fresh light on one of the most obscure, while most widely prevalent, of maladies. Since his arrival at Rome Professor Koch has followed up the quest he started a year ago in Southern and Central Africa, and ably assisted by Dr. Pfeiffer and Dr. Kossel of Berlin and by Professor Bartolommeo Gozio (bacteriologist of the Public Health Department and pupil of his own in the same school), works daily in the fever wards and *gabinetto della clinica* of the Santo Spirito Hospital, both placed at his disposal by Government for as long as he sees fit to use them. From half past six in the morning till noon the four men divide their labour and time between the bedsides of the patients and the laboratory; at 3 P.M. they resume operations; and only at 6 o'clock, or sometimes later, do they suspend them till the morrow. Professor Koch has twenty typical cases under his eye for clinical observation and bacteriological analysis, but he makes a point of seeing every fresh patient on admission, always with a view to symptoms or phenomena either novel or more pronounced. Not only so, but on certain days he proceeds to such *foci malariæ* in the neighbourhood as the Trappist monastery of the Tre Fontani (the scene of St. Paul's martyrdom); and on others he goes further afield—to Ostia, at the mouth of the Tiber, to Maccarese, and even to the Pontine Marshes. These excursions he makes for etiological purposes, so as to study the genesis of the fever, or at least the conditions under which it is intensified, if not actually evolved. On this side of the subject he expressed himself to the Commendatore Santoliquido, of the Public Health Department, as materially indebted to the Italian investigators, from Lancisi early in last century, down to Tommasi-Crudeli and his successors, whose work dates from 1878 onwards. I may add that he seldom misses a necropsy, particularly if the dead subject has had the disease in its *forma perniciosa*. No opportunity, in fact, escapes him of adding to the material necessary whether in the clinical or in the bacteriological field, and, as I have already stated, his experience at the Spedale dello Santo Spirito will be supplemented by a series of visits to the hospitals of the Roman garrison, in which, especially at this season, typical cases of the fever in its various forms are always to be found.

The University of Cambridge and Professor Golgi.

While on the subject of malaria I may mention the genuine gratification of the profession in Italy at the honour just bestowed by the University of Cambridge on one of the most meritorious workers in that field. Professor Camillo Golgi received not only from the Pro-Rector and his colleagues in the University of Pavia their cordial congratulations on the high distinction awarded him, but the mayor of the town, in name of the Giunta and the citizens, sent him similar felicitations on the event. The happy epigram in which Dr. Sandys, the Public Orator, conveyed the honour has already gone the round of the Italian press. "The death of Camillus by malaria has been avenged by a second Camillus" (*Camilli mortem pestilentia abrumpti Camillus alter ultus est!*). Academic Italy has not forgotten how, on the occasion of the centenary celebrations of Bologna and Padua in 1888 and 1892 respectively, Cambridge far outshone her European sisters in the classic elegance, both in verse and prose, in which she couched her congratulations to either University, and she is glad, amid the controversies now raging as to the retention or modification of her time-honoured faculties, to cite the example of the English seat of learning where science, pure and applied, and literature, ancient and modern, are cultivated side by side without prejudice to either, but rather to the reciprocal advantage of both.

The Heat.

We are now emerging from a period of high temperature rarely experienced even in a Roman August. It was fondly hoped that this year's summer months would have been moderate as to heat, considering the extraordinary rainfall of June and July; but from August 15th the thermometer rose steadily, reaching on that day a maximum of 32·2° C., and steadily mounting still higher, particularly in the Alta Italia, where at Milan, Pavia, Brescia, Cremona, and other meteorological stations, a temperature truly tropical was registered. "It is difficult," says Signor Pio Bettoni, the able director of the observatory at Salò, "to explain this phenomenon. We cannot, in my judgment, accept the hypothesis that these excessive heat-waves are due to the state of eruptive activity of the *superficie solare* and other cosmic conditions. I greatly doubt whether more value can be ascribed to those 'variations of climate,' according to the theory of Brückner, received with such favour by some meteorologists who hold them to be *fenomeni meteorici* subjected to a periodicity of thirty-five years. I hazard no opinion of my own, but I invite attention to a fact. When during the day the sky has been notably clear, with a prolonged solar illumination, as we have lately experienced, and when during the night it has been cloudy or starless, we invariably have at this season a marked recrudescence of heat."

Sept. 5th.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Medical Practitioners in Austria.

THE number of medical practitioners in Lower Austria has increased from 1936 in 1889 to 2593 in 1896, in Bohemia from 1629 in 1889 to 2131 in 1896, and in Galicia from 860 in 1889 to 1221 in 1896. Those who have passed away included 588 surgeons of the old school (*Wundärzte*), and 2544 young graduates have entered on a medical career. In 1889 there were 248 places without any medical practitioner, but in 1896 the number was 9 per cent. less.

Stypticin.

Dr. Braitenberg has published an interesting report on the use of stypticin in uterine hæmorrhages, especially those which are due to perimetritis, parametritis, inflammation of the adnexa, or profuse and protracted menstruation. Stypticin forms a yellow crystalline powder and is the hydrochloric acid compound of cotarnine, a base which is obtained from narcotine, one of the opium alkaloids. It may be given in doses of 0·05 gramme (¾ grain); in urgent cases the dose may be increased to 0·1 gramme or 0·2 gramme (1½ grain or 3 grains) injected into the gluteal region.

The Retort of an Unqualified Practitioner.

A patient who had lost confidence in ordinary medical treatment sent to an unqualified practitioner for a supply of Alpine moss, the curative powers of which were highly vaunted. At different times eight parcels of moss were sent to him, each costing 20 gulden (about £1 15s.), but it proved to be useless, and in reply to a threat that he would take legal proceedings he received a letter to the effect that if the moss had not done good to him it had at any rate done good to the sender, who made a livelihood out of people with plenty of money. The patient was also informed that if he used the moss for stopping up the chinks of his windows in autumn he would be protected from draughts and would feel less pain.

Treatment of Chronic Arthritis.

A recent number of the *Medicinische Presse* contained an article by Dr. Bier on the treatment of chronic arthritis by active hyperæmia and engorgement. In 1891 he tried the experiment of treating tuberculous diseases of the joints with hot air applied so as to produce artificial hyperæmia, and he afterwards used this method in chronic arthritis, but in the latter case he found engorgement more effectual, for the hyperæmia produced by engorgement is more marked and lasts longer than that obtained with hot air. When engorgement is to be employed the leg is enveloped in a cambric bandage reaching from the toes to the knee for the purpose of preventing engorgement of the blood in healthy parts, and an indiarubber bandage is then applied over the knee-joint, so that it becomes cyanotic. The bandage must remain constantly in position until the pain has disappeared.

ept. 4th.

NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

The American Medical Association and the Requirements for the Degree in Medicine.

THE American Medical Association in 1892 unanimously resolved to demand of all the medical colleges of the United States the adoption and observance of a standard of requirements of all candidates for the degree of Doctor of Medicine

which should in no manner fall below the minimum standard of the Association of American Medical Colleges, and this demand was sent officially by the permanent secretary to the dean of every medical college in the United States. Now the association gives notice that hereafter no professor or teacher in, or any graduate of, any medical college in the United States which shall after Jan. 1st, 1899, confer the degree of Doctor of Medicine or receive such degree on any conditions below the published standard of the Association of American Medical Colleges will be allowed to register as either delegate or permanent member of this association.

The Nursing Bottle Ordinance.

The Health Department of the city of Buffalo enacted the following ordinance in 1890: "It shall be unlawful for any person or persons to use or engage in the sale of any bottle, mechanism, or other device for the artificial feeding or nursing of infants or children under three years of age that has connected therewith a rubber tube, hose, or similar contrivance." The object of this ordinance was to banish from the market the long-tube nursing bottle. Five convictions have since been secured by the Health Department and suits have been commenced against thirty other dealers. Vigorous opposition to the ordinance is being made in the courts, but the Department is sustained by the County Medical Society, which recently issued the following statement: "The death-rate among the artificially-fed newly-born marks the level of the sanitary enlightenment of the community. Competent medical opinion has, and does, unhesitatingly and unanimously condemn a certain type of feeding bottles in frequent use. Inspired by such well-founded conviction ordinances forbidding the sale of this apparatus were recently enacted by the proper authorities of this city. The relations between the professions of medicine and pharmacy are, and should be, most reciprocal and harmonious, the pharmacist being a conspicuous citizen, learned in medicine, with singular opportunities to form and develop a right public opinion. We commend to the druggists and pharmacists of our city, our health ordinances in general, and with greater particularity the ordinance forbidding the sale of a certain class of feeding-bottles, as timely, wise, and in the best interests of the public health; and we invite them to join us in supporting these ordinances with their earnest and constant efforts. We commend to all those in authority the subject of the preservation of the lives of the newly-born and those of tender years as of the highest practical importance and deserving their incessant and sleepless vigilance. We approve, in the most hearty and unqualified terms, of the ordinance prohibiting the sale of any nursing-bottle which has connected therewith a rubber tube, hose, or similar contrivance."

Precautions against Yellow Fever.

Precautions are being taken by both the War and Treasury Departments to prevent the introduction of yellow fever into the United States. The officials of these two departments are coöperating very thoroughly in the efforts which are being made and the opinion of those best informed is that they will be successful. The Secretary of War has issued the following instructions:—1. That medical officers of the United States Marine Hospital Service be immediately detailed for duty at Santiago, and subsequently at other Cuban or Porto Rican ports under control of United States forces, to carry out the requirements of the Quarantine laws of 1883, such officers to issue certificates and perform other duties of sanitary or other port inspectors. 2. That all sanitary matters pertaining to the condition of transports and crews be placed under the jurisdiction of the medical officers of the Marine Hospital Service of the United States. Every vessel engaged in the transport service between the United States and Cuban or Porto Rican ports to carry a medical officer of the Army or of the Marine Hospital Service, whose duty shall be that of sanitary inspector of the vessel, and who shall see that in a foreign port no material or person is taken aboard liable to convey yellow fever, to keep the crews of the transports under surveillance, and on the return voyage to act as sanitary inspector. 3. That there be placed at Santiago and every chief port where practicable a receiving ship for the recreation of those who take passage for ports in the United States. This ship would be practically a detention camp and quarantine station and passengers seeking homeward voyage would be taken from this vessel after they had undergone a period of observation and disinfection of their effects.

A Steam Vessel Equipped for Disinfection.

The *Protector*, the first vessel in the world to be equipped solely for the purpose of disinfection, is about 80 ft. long. On deck is a structure fitted for bathrooms. It is intended that soldiers shall come on board, take a bath, and give up their clothing, receiving new clothes in exchange. The old clothing will then be taken below, thoroughly sterilised, and then returned to the owner. In the bow of the boat are a sulphur furnace, combustion chambers, and a fan for disinfecting vessels. In the middle are a sterilising chamber and a formaldehyde generator. A boiler and a water-heater are near the stern. The sulphur furnace will be used for disinfecting vessels. The hatches of the vessel to be treated will be battened down and piping carried from the *Protector* to the hold of the vessel. Through this tubing sulphur fumes will be pumped by the fan in the *Protector*. Air is drawn into and through the sulphur furnace, baffle-plates being so placed as to thoroughly mix air and sulphur fumes, a fairly perfect combustion being thus obtained. The sterilising apparatus consists of a cylinder, a chamber, and an exhauster. The chamber is of iron and though open at both ends it can be hermetically sealed. The exhauster consists of a steam-jet for removing air from the chamber. The generator is a copper cylinder divided vertically into two parts, a steam coil being placed in each part. The clothes to be sterilised are placed in the chamber, the air in which is removed by means of the steam-jet exhauster. Formaline is placed in part of the generator and steam admitted to the coil, and when sufficient heat has been thus applied to generate the required amount of formaldehyde gas the gas is admitted to the chamber. At the end of half an hour ammonia placed in the other part of the generator and similarly heated is admitted to the chamber. This neutralises the formaldehyde and the clothes are removed and returned to the owners.

August 19th.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

The Epidemic of Measles in Victoria.

MEASLES made its appearance in epidemic form in Victoria in December last. The outbreak appears to have reached its greatest severity in April and to be now abating. During the whole period 341 persons, chiefly children, have died from the disease. The Board of Health has directed an inquiry to be made by its assistant medical officer into the circumstances associated with the fatal cases. It is believed that while the epidemic has been most impartial in its attacks the fatal cases have occurred almost entirely among those in poor circumstances, and it is thought that in future epidemics the mortality might possibly be diminished by a wider dissemination of information and an extension of the system of district nursing. During the last 25 years six epidemics of measles have occurred, of which that in 1874–75 was the most fatal, causing 733 deaths, and that in 1893 was next in fatality, causing 386 deaths. The epidemics have recurred every 4 or 5 years with considerable regularity but apparently uninfluenced by season.

The Water-supply of Bendigo.

In March last the health officer at Bendigo in reporting on a recent outbreak of typhoid fever in that city attributed it to pollution of the water-supply. The analytical chemist for water-supply has made an examination of the locality and a careful chemical and bacteriological examination of various samples of the water from both the reservoir and the mains. In no case was the typhoid bacillus found or the bacillus coli communis. While the failure to find bacilli did not prove that the outbreak was not due to the water-supply his investigations did not bear out the health officer's statements and it was not proved that the outbreak was due to the water-supply. Nevertheless, the water-supply was not good and was liable to pollution in the reticulation area. He recommends a system of house filtration under official control, for which an efficient filter is now available at a cheap rate.

Melbourne Fever Hospital.

The Premier of Victoria has officially notified the Heidelberg Municipal Council that it had been finally decided to grant fifteen acres of the reserve at the Yarra Bend

Lunatic Asylum to the Infectious Diseases Hospital Committee subject to the following conditions: (1) that the site be enclosed by a high iron fence; (2) that no person suffering from small-pox, plague, or other exotic infectious or contagious disease be admitted to the hospital; (3) that no drainage be permitted to pass into the River Yarra or through the asylum reserve (except by underground sewer connected with the Metropolitan Board of Works system) unless on such conditions as may be approved of by the lunacy department, that is, by the chief secretary or inspector of asylums for the insane; (4) that the Government shall have the right to send patients to the hospital; and (5) that any requirements of the Minister of Health as to dealing with infectious matter and passing the air from the wards through fire shall be complied with.

The Public Charities in Victoria.

The report of the inspector of charitable institutions in Victoria has just been laid before Parliament. The accommodation provided and the number of inmates at the various institutions were as follows:—

	Beds provided.	Inmates.
Hospitals	2253	1716
Hospitals and benevolent asylums	667	555
Benevolent asylums	2350	2314
Orphanages	983	884
Asylums (blind, deaf and dumb, and infant)	256	225
Refuges	524	526
Convalescent homes	63	29
	7096	6249

The number of persons receiving charitable relief for the year is estimated at 99,277, of whom 71,698 received outdoor relief. The chief sources of income, irrespectively of the Government grant of £100,000, were:—

Municipal grant	£8,022
Locally raised contributions...	79,533
Interest upon investments	9,738
Paying patients and paying pupils	7,754
Out-patients' fees	3,616
Proceeds of inmates' labour...	9,407
Legacies and bequests	4,149
Other sources	11,476
	£133,695

The cost per bed per annum for the daily average of patients varied a good deal in the leading hospitals and on the whole was considerably higher than in similar institutions in Great Britain. Thus the cost at the Melbourne Hospital was £75 12*s.* 9*d.*; at the Alfred Hospital, Melbourne, £70 11*s.* 8*d.*; at the Women's Hospital, Melbourne, £74 13*s.* 3*d.*; at Ballarat Hospital, £52 7*s.* 9*d.*; and at Bendigo Hospital, £49 14*s.* 7*d.* The inspector advocates the establishment of a Nurses' Fund for sickness and superannuation and a half-yearly inspection and test of the efficiency of the fire-appliances of each institution. He expresses fear that serious loss of life would occur in the event of an outbreak of fire at any of the hospitals or asylums, since in none that he had visited did the employés know their stations in case of such emergency. At the annual meeting of the Charity Organisation Society the President (Professor Morris) said the work of the society was of two kinds, registration and inquiry into individual cases and the organisation of charity. The case work had now been so well done that when a subscriber sought information it could generally be given at once, as in the books of the society were to be found particulars of 11,000 cases. The organisation of charity, however, was not so satisfactory and must be taken in hand by the Government. The great need of the charities was not more money but better organisation and administration. Many of the hospitals had a large number of what were really benevolent asylum inmates, maintained in the hospitals at expensive rates. Victoria was quite sufficiently supplied with hospitals; in fact, the Government should provide measures to prevent the creation of unnecessary hospitals, but was lamentably deficient in benevolent asylums. Professor Morris also criticised very adversely the methods of electing the medical staffs at some of the hospitals by the votes of the subscribers.

Deaths at the Melbourne Benevolent Asylum.

An article appeared recently in the *Melbourne Argus* stating that 600 deaths had occurred in three years at the Melbourne Benevolent Asylum and no inquest had been held at the institution since the year 1891. The secretary to the asylum reported that the actual number of deaths in the last three years was 450 and it was pointed out that it was not the fault of the officers of the institution if no inquests were held and that no necessity for holding inquests existed, most of the patients dying from natural causes and the ordinary certificate being given by the medical officer.

Lunatic Asylums in Victoria.

The inspector of hospitals for the insane in Victoria has presented his annual report. He again draws attention to the overcrowding of the metropolitan asylums. The asylum population has increased largely within the last few years and will probably continue to increase, and provision must be made to accommodate the increase. He recommends that the Ballarat Asylum should be enlarged and special provision made at it for epileptics. The removal of all epileptics from the metropolitan asylums would enable a better system of classification to be introduced and better means to be adopted for the treatment of recent and curable cases. Great difficulty has been experienced in obtaining suitable men to fill vacancies on the medical staff owing to the low rate of pay given by the Government. Two vacancies for junior medical officers exist at the present time, but no applications have so far been received. The inspector urges that arrangements should be quickly made which will secure and retain in the service competent officers on whom depends in a great measure the satisfactory working of the asylums. The inspector also complains of the low rate of pay of some of the nurses and attendants, which causes many changes in the staff by resignations and transfers to other departments.

A Medical Man committed for Manslaughter.

On July 4th at the coroner's court, Sydney, Dr. Terence Albert Green was committed to take his trial for the manslaughter of Pauline Durlac. The circumstances of the case are of considerable medical interest. Dr. Green was first consulted by Miss Durlac about four months before her death for injuries received to her leg in an accident. After her recovery she was treated for some uterine condition, which, he said in evidence, he diagnosed as chronic enlargement of the uterus and endometritis. He advised curettage, and first to have a consultation with Dr. Worrall. The patient declined the consultation but decided to have the operation performed. Dr. Martin administered chloroform and after the operation was commenced Dr. Green discovered that the patient was pregnant. He then cleared out the uterus. Severe hæmorrhage followed and the patient died. Dr. Green, after a conversation with Dr. Martin as to reporting the death to the coroner, gave a certificate that death was due to endometritis and hæmorrhage. The police were subsequently informed and the body was exhumed. Dr. Rennie and Dr. Taylor made a post-mortem examination and found a rupture in the uterus and stated in evidence that the cause of death was rupture and hæmorrhage, that the breast contained milk, and that it ought to have been quite possible to have diagnosed that deceased was pregnant during life. The coroner, in summing up, said that from the evidence it appeared that Dr. Green did not visit the patient with intent to commit a criminal act. The jury had to consider, however, whether culpable negligence had not been shown in not ascertaining the patient's condition before operating and whether there was not carelessness in the performance of the operation itself, and to consider the fact that the actual conditions had been concealed and a wrong certificate given. The jury found that the deceased died from hæmorrhage consequent upon an operation performed by Dr. Green, who did not exercise the necessary precautions to ascertain her condition. The coroner said that that was equivalent to a verdict of manslaughter, to which the jury assented.

The Coast Hospital, Little Bay, Sydney.

The report of the chief medical officer of the Government on the Coast Hospital, Sydney, has been presented to Parliament. The institution is used as a hospital for infectious and typhoid fevers and as a hospital for chronic cases and for convalescents. A moderate number of out-patients from the neighbourhood had been treated and surgical cases had gradually been admitted. The total number of cases treated had increased from 1132 in 1884 to 2307 in 1897, and the average daily number of in-patients from 104 to 224. An increase in the medical staff was recommended.

The Financial Position of the Melbourne Hospital.

The annual report of the Committee of Management of the Melbourne Hospital shows a deficiency of revenue of over

£5000 for the year. The cost of maintenance has been increased by the advance in the prices of supplies and the extra nursing required by the prevalence of epidemic disease. The total expenditure was £25,953, an increase on the previous year of £1551. The total receipts amounted to £20,645. A special committee has been appointed to investigate the expenditure and devise means of increasing the income. One means suggested is to endeavour to get contributions from in-patients. This plan has been adopted at the Alfred Hospital, Melbourne, with very satisfactory results. The strain upon the resources of the Melbourne Hospital is shown by the fact that 340 patients had to be refused admission for want of room. In the wards for infectious cases alone 613 patients had been treated, 264 of which were cases of diphtheria, and the high price of antitoxin, which had been freely used, was an item in swelling the expenditure.

Death of a Centenarian.

On July 22nd Mrs. John Beirs died at Adelaide at the age of 102 years. She arrived in the colony in 1838, and had been bedridden for ten years.

July 31st.

Obituary.

GEORGE ROPER, M.D. ABERD., M.R.C.P. LOND., M.R.C.S. ENG.

DR. ROPER belonged to a family which had lived at Colby in Norfolk for about three hundred years. He was the third son of Mr. Snelling Drosier Roper and was born at Colby on August 15th, 1823. He received his medical education at Guy's Hospital and became a Member of the Royal College of Surgeons of England and a Licentiate of the Apothecaries' Society in 1847. After a voyage in one of the Hudson Bay Company's ships he started in general practice in the prolific centre of Shoreditch, joining Mr. F. Wildbore as assistant and later succeeding him as chief. His work was arduous and he acquired a good reputation in the East-end, in particular as a scientific and successful obstetrician. Fortune favoured him in that he received substantial legacies which made him independent. He gave up general practice, went to Aberdeen for a year, where he took the degree of M.D. in 1873, and became a Member of the Royal College of Physicians of London in 1874. He settled for a time in Finsbury-circus and was elected physician to the Royal Maternity Charity for the Eastern Division. During four years he did good work in that capacity and he summed up his experience in a memoir on "The Use of the Forceps and its Alternatives" which was printed in the *Transactions of the Obstetrical Society of London* in 1879. He also contributed a paper on the Action of the Ileo-cæcal Valve in Stercoraceous Vomiting to the *Medical Gazette* in 1849, an account of a Case of Sudden Death during Labour to THE LANCET in 1855, and a paper on Cases of Hypertrophic Elongation of the Cervix Uteri in Labour at Full Term to the *Transactions of the Obstetrical Society of London*. Having been elected physician to the Royal Hospital for Children and Women, Waterloo-road, he removed to Ovington-square and had at the same time consulting-rooms near Cavendish-square. But after a short time he left London and settled at Oulton, near his native place in Norfolk, where he lived for some years. He never married, and failing in health he gave up his house and went to live with some relatives at Southwold in Suffolk, where he died on August 14th, 1898, at the age of seventy-five years. He was a vice-president of the Obstetrical Society of London and of the Hunterian Society, a Fellow of the Royal Medical and Chirurgical Society, and a Corresponding Member of the Gynæcological Society of Boston. Dr. Roper was a good judge of horses and an ardent lover of sport of all kinds—shooting, coursing, racing, and salmon fishing. He had also travelled much. As we have already said, on becoming qualified he went to Hudson's Bay as surgeon on one of the Company's vessels; in 1867 he went to China, Japan, Canada, and the United States; in 1881 he spent many months in Holland, the south of France, Italy, and Spain; and in 1886 and 1887 he travelled for eighteen months in Canada and the United States.

Sir Samuel Wilks writes as follows concerning Dr. George Roper, whom he knew intimately: "No man have I more respected than Dr. George Roper. Knowing him first as a fellow student and then through a long life, my estimate of him, both professionally and personally, has been of the highest. I remember Dr. Roper in general practice in the East-end of London, and it was a large and remunerative one. I often spoke to him of his choice of locality in a low-class neighbourhood, and he answered me quite characteristically that he would rather earn a guinea by seeing a dozen poor people over whom he had influence than by spending the time in talking over the imaginary grievances of some ancient dowager. Straightforwardness and independence of character were his main qualities. He told me that he had never quarrelled with a brother practitioner but had had some severe differences with more than one leading man in the profession owing to his belief that he had been unfairly dealt with in consultation. He was not the man to accept an insult, and just and generous as he was to others he conceived that they should act in the same manner towards himself. He was remarkably acute in his insight into cases and with a good knowledge of his profession he made some capital diagnoses in cases of difficulty. He took a great interest in and paid especial attention to operative midwifery. In middle life he determined to give up general practice and to devote himself to his favourite specialty as a consultant. Having no degree he proceeded to Aberdeen and nothing better than this determination to do so showed Dr. Roper's indomitable perseverance. He entered the classes and examinations like other and younger students, where his ardour was so marked that he became known as 'young Roper.' After he took his degree he became a Member of the Royal College of Physicians of London and attached himself to the Infirmary for Women and Children in the Waterloo-road, where he had an opportunity of practically applying his knowledge of female diseases with great benefit to the institution. He was a diligent member of the Obstetrical Society and a most valuable officer of the Maternity Charity."

From Sir Samuel Wilks's sympathetic little note, as well as from the facts of Dr. Roper's life which we have briefly given, it will be clear that he belonged to an order of practitioners whose members can be ill spared by the profession or the public. He combined a love of science and a grasp of its principles with a delight in the practical side of his work, and he was above all things anxious to be the friend of his patients and to do them good in all ways. Dr. Roper had suffered severely from angina pectoris for several years before his death, which, in the end, occurred somewhat suddenly.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. Evert Julius Bonsdorff, formerly Professor of Anatomy and Physiology in the University of Helsingfors.—Dr. H. Endres, *privat-docent* of Anatomy and Histology in the University of Halle.

Medical News.

FOREIGN UNIVERSITY INTELLIGENCE.—*Vienna:* Dr. Arthur Schattenfroh has been recognised as *privat-docent* of Hygiene.—*Berlin:* Dr. Georg Puppe has been recognised as *privat-docent* of Forensic Medicine.—*Budapest:* Dr. Géza Krepuska has been recognised as *privat-docent* of Otology, Dr. Karl Morelli as *privat-docent* of Laryngology and Rhinology, and Dr. Desider Kuthy as *privat-docent* of Hydrotherapy and Climatology.—*Bologna:* Dr. Umberto Monari of Turin has been recognised as *privat-docent* of Surgery.—*Cincinnati (Ohio Medical College):* Dr. C. L. Bonifield has been appointed Professor of Clinical Gynæcology and Dr. S. C. Ayres Professor of Ophthalmology.—*Cracow:* Dr. Wladimir Sieradzki has been recognised as *privat-docent* of Forensic Medicine.—*Modena:* Dr. Giulio Vassale has been promoted to the chair of General Pathology.—*Naples:* Dr. Gaetano Sorge has been recognised as *privat-docent* of Operative Medicine.—*Prague (Bohemian University):* Dr. Alois Velich has been recognised as *privat-docent* of General and Experimental Pathology, Dr. Karl

Svehla as *privat-docent* of Pædiatrics, and Dr. Ivan Honl as *privat-docent* of Bacteriology.

A STRANGE OBJECTION TO CALF LYMPH.—At the meeting of the Chard (Somerset) Board of Guardians held on Aug. 22nd a member mentioned a rumour that children vaccinated with calf lymph were in the habit of "blaring" at night.

AN UNREGISTERED DENTIST.—At the Pontypridd Petty Sessions held on Aug. 24th a man named Charles was fined £5 for practising as a dentist without being registered under the Dentists Act. The evidence showed that the defendant possessed the D.D.S. of America.

THE LATE MR. AUGUSTIN PRICHARD.—The family of the late Mr. Augustin Prichard, F.R.C.S., of Bristol, have presented to the Bristol Museum the valuable collection of human crania brought together by the distinguished ethnologist Dr. James Cowles Prichard and his son, the late Mr. Augustin Prichard.

THE DOWAGER LADY HOWARD DE WALDEN has presented a site for a nurses' home and club in connexion with the Nurses' Coöperation (of which H.R.H. Princess Louise, Marchioness of Lorne, is patroness) and has promised to provide a large proportion of the cost of erecting a suitable building.

SOMERSET ARCHÆOLOGICAL SOCIETY. — The fiftieth annual meeting of the Somersetshire Archæological and Natural History Society was held at Taunton recently. In order to celebrate the jubilee by a permanent memorial it was proposed to restore the ancient hall of Taunton Castle, the property of the society, and to convert it into a museum.

AMERICAN CLIMATOLOGICAL ASSOCIATION.—The fifteenth annual meeting of this association was held at the Maplewood Hotel, near Bethlehem, New Hampshire, on August 31st and Sept. 1st, 1898. An opening address was delivered by the President, Dr. E. O. Otis of Boston, who took for his subject Avenbrugger and Laennec, the Discoverers of Auscultation and Percussion.

VACCINATION AT DEVIZES.—At a recent meeting of the Devizes Board of Guardians it was stated that the vaccination returns for the first district of the union, which includes Devizes, showed that during the six months ended Dec. 31st, 1897, there had been 164 births, and that of these children 62 had been successfully vaccinated, 8 had died unvaccinated, 3 had removed, and 91 were unaccounted for.

UNIVERSITY COLLEGE OF WALES.—Sir William Vernon Harcourt will open on Oct. 26th the new portion of the University College of Wales, Aberystwyth, erected at a cost of nearly £20,000. In the evening the Master of Trinity College, Cambridge, will give the inaugural lecture and on the following day the degrees of the Welsh University will be conferred at Aberystwyth.

NATIONAL REGISTRATION OF PLUMBERS.—A public meeting will be held in the Mayor's Parlour, Manchester, on Sept. 19th, at which the Lord Mayor will distribute the prizes, certificates, and bronze medal of the Plumbers' Company awarded in connexion with the recent Exhibition of Plumbers' Work at Manchester. The programme will include a lecture on the Registration of Plumbers and Domestic Sanitation, by Dr. Mansel-Howe.

PRESENTATION TO A MEDICAL MAN.—At a public meeting held at Cwmavon, near Port Talbot, on August 27th, which was presided over by the Mayor of Aberavon, Mr. Robert William Roberts, L.R.C.P. & S. Edin., L.F.P.S. Glasg., was presented with a drawing-room clock with ornaments, dining-room clock with ornaments, etchings, and an ophthalmoscope, as a mark of respect and esteem on the occasion of his marriage.

THE DEATH OF MR. EDWARD CURTICE.—Mr. Edward Curtice, proprietor of the Press Cutting Agency of Romeike and Curtice, passed away on August 30th at his residence in Museum-street, after a long and painful illness. Mr. Curtice, who commenced as a wholesale newsagent and publisher, was the first to recognise the value of Romeike's enterprise in starting some twenty years ago a press-cutting agency which should be a general intelligence bureau.

THE LONDON HOSPITAL.—A quarterly court of the governors of this hospital was held on Sept. 7th, when a promising financial position was revealed. A special appeal was made early in the year for £100,000, of which £77,000 has been received or promised in donations and £11,000 in annual subscriptions. The Press bazaar in aid of the hospital brought in £12,000, while it is understood that the Prince of Wales's Hospital Fund will make a large annual donation conditional upon certain improvements in structure being made. Three new operating theatres are to be built at the cost of £13,000, the expenses being entirely defrayed by an anonymous donor. An annual saving of over £1000 a year is said to have been effected by charging certain of the out-patients 3*d*. for bandages and medicines. This is a departure at the London Hospital and one that will probably attract some attention.

BOOKS, ETC., RECEIVED.

BAILLIERE, TINDALL, AND COX, King William-street, Strand, London.
Cattle Tuberculosis. By T. M. Legge, M.A., M.D., D.P.H., and H. Sessions, F.R.C.V.S. 1898. Price 2*s*. 6*d*. net.

BAUERMEISTER, F., Glasgow.
Mikroskopie des Auswurfes. Von Dr. A. Daiber. 1898.
Zur acuten Ueberanstrengung des Herzens und deren Behandlung. Von Dr. Th. Schott. 1898.
Die manuelle Beckenschätzung. Wann sind Falschlagen der Gebärmutter Gegenstand der Behandlung. Von Dr. H. Lohlein. 1898.
Ueber den künstlichen Hornhautersatz. Von Dr. F. Salzer. 1898.
Die therapeutischen Leistungen des Jahres 1897. Von Dr. Arnold Pollatschek. IX. Jahrgang. 1898.

HIRSCHWALD, A., Berlin.
Encyklopädie der Therapie. Von C. Liebreich. Zweiter Band. 1898.
Therapie der Harnkrankheiten. Von Professor Dr. C. Posner. Zweite Auflage. 1898.

KIMPTON, H., High Holborn, London, W.C.
A Manual of Clinical Diagnosis. By C. E. Simon, M.D. Second edition. Illustrated. 1898.
A Text-book of Surgery. By H. Tillmanns. Translated from the Fourth German Edition by B. T. Filten, M.D., New York. Edited by L. A. Stimson, M.D. Vol. III.—Regional Surgery. Illustrated. 1898. Price 21*s*. net.
A System of Practical Medicine. Edited by A. L. Loomis, M.D., LL.D., and W. G. Thompson, M.D. Vol. IV.—Diseases of the Nervous System. Illustrated. 1898. 25*s*. net.

LEWIS, H. K., Gower-street, London.
Dwelling Houses: Their Sanitary Construction and Arrangements. By W. H. Corfield, M.D. Oxon., F.R.C.P. Lond. Illustrated. Fourth edition. Price 3*s*. 6*d*. 1898.

LIPPINCOTT, J. B., COMPANY, London and Philadelphia.
System of Diseases of the Eye. By American, British, Dutch, French, German, and Spanish authors. Edited by W. F. Norris, M.D., and Chas. A. Oliver, M.D. Vol. III. Illustrated. 1898. Price 21*s*. net.

MASSON ET CIE., Paris.
Hernies. Par. P. Berger. 1898.

NICHOLS AND CO., Oxford-street, London.
Nature *versus* Drugs. A Challenge to the Drugging Fraternity. By A. F. Reinhold, Ph.D., M.D.

OFFICE OF "THE CHEMIST AND DRUGGIST," 42, Cannon-street, London.
Diseases and Remedies: A concise survey of the most modern methods of medicine, written expressly for the Drug Trade. By Physicians and Pharmacists. 1898.

OFFICES OF THE SANITARY INSTITUTE, Margaret-street, London.
Illustrated List of Exhibits, to which medals have been awarded at their Exhibitions, held in connection with Congresses. 1898. Price 1*s*.

PUTNAM'S, G. P., SONS, Bedford-street, Strand, London.
Electricity in Diseases of the Nose, Throat, and Ear. By W. Scheppegrell, A.M., M.D. 1898.

REEMAN PUBLISHING COMPANY, Shaftesbury-avenue, Cambridge-circus, London.
Health Loss and Gain. No. 1. A Plea for the more extended Practice of Preventive Medicine. By M. A. Chreiman. 1898. Price 3*s*. net.
The Ferment Treatment of Cancer and Tuberculosis. By H. Manders, M. D., F.R.C.S. 1898. Price 10*s*. 6*d*.

RENSHAW, H., Strand, London.
Elements of Pharmacy, Materia Medica, and Therapeutics. By Wm. Whitla, M.A., M.D. With Woodcuts. Seventh edition. 1898.

SKEFFINGTON AND SON, Piccadilly, London.
Where Two Worlds Meet. By Rosa E. March. 1898.

STEINHEIL, G., Paris.
De l'Exploration des Organes Internes. Par Dr. L. Bouchacourt. 1898.

SWAN SONNENSCHEIN AND CO., London.

Radiation. By H. H. F. Hyndman, B.Sc. Lond. With a Preface by Professor S. P. Thompson, D.Sc., F.R.S. 1898. Price 6s.

VIEWEG UND SOHN, Braunschweig.

Lehrbuch der Anorganischen Chemie. Von Professor Dr. H. Erdmann. 1898.

WAHR, GEO., Ann Arbor.

Laboratory Work in Physiological Chemistry. By F. G. Novy, Sc.D., M.D. Michigan. Second edition. Illustrated. 1898.

A Catalogue of Ophthalmic Instruments and Appliances Manufactured by John Weiss and Son, Oxford-street, London, and King-street, Manchester.—Magazines, &c., for September: Strand Magazine, Boy's Own Paper, Girl's Own Paper, Leisure Hour, Sunday at Home, Ludgate Magazine, Westminster Review, Contemporary Review, Friendly Greetings, Chapman's Magazine, Myra's Journal, Pall Mall Magazine, Windsor Magazine, Cornhill Magazine, Blackwood's Magazine, Pearson's Magazine, English Illustrated Magazine, Knowledge, Humanitarian, Wide World Magazine, St. Peter's Magazine.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, for publication in the next number.*

ALLFREY, F. H., B.A. Camb., L.R.C.P., M.R.C.S., has been appointed Clinical Assistant in the Special Department for Diseases of the Ear at St. Thomas's Hospital.

BADINGTON, S. N., L.R.C.P., M.R.C.S., has been appointed Senior Ophthalmic House Surgeon to St. Thomas's Hospital.

BARNES, J. A., L.R.C.P., M.R.C.S., has been appointed Assistant House Surgeon to St. Thomas's Hospital.

BELFRAGE, S. H., L.R.C.P., M.R.C.S., has been appointed Clinical Assistant in the Special Department for Diseases of the Skin at St. Thomas's Hospital.

BINGHAM, S. O., L.R.C.P., M.R.C.S., has been appointed Assistant House Surgeon to St. Thomas's Hospital.

BUZZARD, E. F., B.A., M.B., B.Ch. Oxon., has been appointed House Physician to St. Thomas's Hospital.

CHARLES, J. R., B.A., M.B., B.C. Camb., L.R.C.P., M.R.C.S., has been appointed House Physician to St. Thomas's Hospital.

COBB, E. H., L.R.C.P., M.R.C.S., has been appointed House Surgeon to St. Thomas's Hospital.

CORNER, E. M., M.A., M.B., B.C. Camb., B.Sc. Lond., L.R.C.P., M.R.C.S., has been appointed Assistant House Surgeon to St. Thomas's Hospital.

COWBURN, A. D., L.R.C.S., M.R.C.S., has been appointed Clinical Assistant in the Special Department for Diseases of the Throat at St. Thomas's Hospital.

DALTON, THOMAS, M.D., M.R.C.S. Eng., has been appointed a Medical Referee under the Workmen's Compensation Act (1897) for County Court Circuit No. 28.

DURRANT, CHARLES E., L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Resident Medical Officer to the National Sanatorium for Consumption and Diseases of the Chest, Bournemouth.

EDMUNDS, WALTER, M.A., M.C., has been appointed Surgeon to Out-patients on the Honorary Medical Staff of the Evelina Hospital.

ELIOT, E. F., F.R.C.S., L.R.C.P. Edin., F.F.P.S., L.S.A. Lond., has been appointed a Medical Referee under the Workmen's Compensation Act, 1897, for the Southampton, Winchester, and Romsey Districts.

FEGEN, C. M., M.R.C.S. Eng., L.R.C.P. Edin., Diploma in State Medicine Conjoint Colleges of Ireland, has been appointed Deputy Medical Officer of Health to the Croydon Rural District Council, vice L. W. D. Mair.

GALT, W. J., B.A. Oxon., L.R.C.P., M.R.C.S., has been appointed Clinical Assistant in the Special Department for Diseases of the Ear at St. Thomas's Hospital.

GREAVES, F. L. A., L.R.C.P., M.R.C.S., has been appointed House Surgeon to St. Thomas's Hospital.

GREG, A. H., B.A. Camb., L.R.C.P., M.R.C.S., has been appointed House Surgeon to St. Thomas's Hospital.

HALL, J. S., L.R.C.P., M.R.C.S., has been appointed Junior Ophthalmic House Surgeon to St. Thomas's Hospital.

HASLAM, H. C., M.A., M.B., B.C. Camb., L.R.C.P., M.R.C.S., has been re-appointed House Physician to St. Thomas's Hospital.

KILVERT, J. E., L.R.C.P., M.R.C.S., has been appointed Assistant House Surgeon to St. Thomas's Hospital.

MCCLEAN, J. P., L.R.C.P., M.R.C.S., has been appointed Junior Obstetric House Physician to St. Thomas's Hospital.

MAKINS, G. H., F.R.C.S., has been appointed Consulting Surgeon on the Honorary Medical Staff of the Evelina Hospital for Sick Children.

PIERCE, R. W. C., M.B., B.Sc., Lond., L.R.C.P., M.R.C.S., D.P.H. Camb., has been appointed House Physician to St. Thomas's Hospital.

REVELY, J. S., M.D., M.R.C.S., has been appointed Medical Officer to the Tettenhall District of the Seisdon Union.

ROBINSON, A. C., L.R.C.P., M.R.C.S., has been appointed House Surgeon to St. Thomas's Hospital.

SHEA, H. F., M.B., B.S. Durh., L.R.C.P., M.R.C.S., has been appointed Senior Obstetric House Physician to St. Thomas's Hospital.

SHEARS, CHARLES H. B., Surgeon to the Liverpool Eye and Ear Infirmary, has been appointed Ophthalmic Referee for County Court Circuit 6 under the Workmen's Compensation Act, 1897.

SNELL, E. H., M.D., B.Sc. Lond., D.P.H., M.R.C.S., L.R.C.P., has been re-appointed Medical Officer of Health to the City of Coventry an Medical Superintendent to the City Fever Hospital.

STEVENS, A. E., M.B. Durh., L.R.C.P., M.R.C.S., has been appointed Clinical Assistant in the Special Department for Diseases of the Skin at St. Thomas's Hospital.

STURGES-JONES, W. E., M.R.C.S. Edin., L.R.C.P. Lond., L.S.A. Lond., has been appointed Vice-Consul for the Perené and Chanchamayo Districts of Central Peru, South America.

TAYLOR, HENRY J., M.R.C.S. Eng., L.R.C.P. Lond., has been appointed Junior House Surgeon to the Manchester Royal Eye Hospital, vice W. E. Smith.

THWAITES, G. B., L.R.C.P., M.R.C.S., has been appointed Clinical Assistant in the Special Department for Diseases of the Throat at St. Thomas's Hospital.

TUBBY, A. H., M.S., has been appointed Surgeon to In patients on the Honorary Medical Staff of the Evelina Hospital.

WINSTAN, ST. ANDREW ST. JOHN, M.R.C.S. Eng., L.R.C.P. Lond., has been appointed Assistant House Surgeon to the Derbyshire Royal Infirmary, vice Reginald H. Hill.

Vacancies.

For further Information regarding each vacancy reference should be made to the advertisement (see Index)

BELGRAVE HOSPITAL FOR CHILDREN, Gloucester-street, S.W.—House Surgeon for six months. Board and residence in the hospital and an allowance of £5.

BETHLEM HOSPITAL.—Two Resident House Physicians for six months. Apartments, complete board, and washing provided.

CORNWALL COUNTY ASYLUM, Bodmin.—Junior Assistant Medical Officer. Salary £100 per annum, increasing £10 yearly to £120 per annum, with board, lodging, washing, and attendance.

DOVER HOSPITAL.—House Surgeon, unmarried. Salary £100 a year, with board and lodging.

EXETER CITY ASYLUM.—Assistant Medical Officer. Salary £120 per annum, rising by £10 yearly to £150, with board, lodging, and washing.

GENERAL HOSPITAL, Birmingham.—Ophthalmic Surgeon (Honorary). Also Dental Surgeon. Honorarium of £50 per annum. Also House Surgeon. The appointment is for six months. There is no salary, but residence, board, and washing will be provided. Also Pathologist. Salary £100 per annum, with board and residence. The appointment will be subject to annual re-election, to a limit of five years. A knowledge of bacteriology will be deemed essential. Also two Assistant House Physicians for six months. There is no salary, but residence, board, and washing will be provided.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST. Resident House Physicians.

HOSPITAL FOR DISEASES OF THE THROAT, Golden-square, W.—Three Senior Clinical Assistants. The first appointment will be for six months, but is renewable at the discretion of the Committee of Management. Also Resident Medical Officer. Salary £50 per annum, with board, residence, and washing.

LEEDS CITY HOSPITALS.—Assistant Resident Medical Officer. Salary £150 per annum, with board, lodging, &c.

MANCHESTER SOUTHERN AND MATERNITY HOSPITAL.—Resident House Surgeon. Honorarium at the rate of £50 per annum and board.

METROPOLITAN HOSPITAL, Kingsland-road, N.E.—House Physician, House Surgeon, Assistant House Physician, and Assistant House Surgeon for six months. The House Physician and House Surgeon each receive a salary at the rate of £40 a year; the Assistant House Physician and Assistant House Surgeon each receive a salary at the rate of £20 a year.

MONSALL FEVER HOSPITAL, Manchester.—Medical Assistant at £100 per annum, with board and lodgings.

NEW HOSPITAL FOR WOMEN, Euston-road.—Three Clinical Assistants (women) in the out-patient department, to attend on Tuesday, Wednesday, or Friday. The appointments are for one year.

NORFOLK AND NORWICH HOSPITAL, Norwich.—Assistant to House Surgeon for six months. Board, lodging, and washing provided. No salary.

PARISH OF WESTRAY, Orkney.—Medical Officer and Public Vaccinator. Salary £90 per annum.

PRESTON ROYAL INFIRMARY.—Assistant House Surgeon. Salary £50 per annum, with board, rooms, washing, &c.

ROTHERHAM HOSPITAL AND DISPENSARY.—Assistant House Surgeon. Salary £30 per annum, board and washing provided.

ST. GEORGE-IN-THE-EAST.—Infirmary and Workhouse Assistant Medical Officer. Salary £120 per annum, with rations and apartments.

ST. MARY'S CHILDREN'S HOSPITAL, Plaistow, E.—Ophthalmic Surgeon. Also Assistant Resident Medical Officer for six months. Salary at the rate of £40 per annum, with board, lodging, and washing.

STOCKPORT INFIRMARY.—Assistant House and Visiting Surgeon. Salary £70 per annum, with board, washing, and residence. Also a Junior Assistant House Surgeon. Salary £2 per mensem, with board, washing, and residence.

TEIGNMOUTH HOSPITAL, South Devon.—House Surgeon (to act also as Secretary). Salary £60, with board, lodging, and washing.

UNIVERSITY OF ST. ANDREWS.—Professor of Midwifery.

WEST LONDON HOSPITAL, Hammersmith-road, W.—House Physician and House Surgeon for six months.

Births, Marriages, and Deaths.

BIRTHS.

BLOMFIELD.—On August 26th, at The Horsefair, Pontefract, the wife of Geo. Wills Blomfield, M.R.C.S., L.R.C.P., and L.S.A. Lond., of a daughter.

BLUMER.—On August 30th, at St. Mary's-grove, Stafford, the wife of F. Milnes Blumer, M.D., of a son.

FRANCIS.—On August 29th, at Uxbridge, the wife of L. A. Francis, M.R.C.S., L.R.C.P., of a son.

GOSSE.—On August 25th, at Eccleshall, Staffs., the wife of Hope Wilkes Gosse, M.R.C.S. Eng., L.R.C.P. Edin., of a son.

HARDYMAN.—On Sept. 5th, at Bath, the wife of George Hardyman, M.B., F.R.C.S.E., of a daughter.

LAZARUS-BARLOW.—On August 31st, the wife of W. S. Lazarus-Barlow, M.D., of a son (stillborn).

REYNOLDS.—On August 28th, at 31, Hornsey-rise, London, N., the wife of Austin Edward Reynolds, M.R.C.S., of a son.

RYLE.—On August 26th, at German-place, Brighton, the wife of Reginald John Ryle, M.D., of a son.

SHAW.—On August 24th, at Sedgemoor, St. Austell, Cornwall, the wife of Archibald Shaw, M.D. Glasg., of a son.

STAVELEY.—On Sept. 3rd, at South Eaton-place, S.W., the wife of W. H. C. Staveley, F.R.C.S., of a daughter.

WOOLBERT.—On August 9th, at Landour, India, the wife of Major H. R. Woolbert, of a daughter.

MARRIAGES.

ABERNETHY—LYALL.—On Sept. 1st, in St. Thomas's Church, Haverfordwest, by the Rev. Atterbury Thomas, Robert Abernethy, M.D., F.R.C.P. Edin., to Frances Elizabeth, daughter of the late David Lyall, M.D., Deputy-Inspector-General of Hospitals and Fleets, R.N.

CRAWFORD—WILLIAMSON.—On August 31st, Cyril Rodney Holtz Crawford, M.R.C.S., of Pembury, Kent, to Lucy Phillis, second daughter of George Williamson.

DAVIS—GILL.—On Sept. 7th, at Christ Church, Marylebone, John Warren Davis, M.R.C.S. Eng., L.R.C.P. Lond., to Agnes, widow of the late Edmund Richard Gill, of Kimberley, South Africa.

DURRAN—SMITH.—On August 30th, at Bank of Scotland House, Kirriemuir, by Rev. James Durran, M.A., Queen-street F. C., Edinburgh, brother of the bridegroom, assisted by Rev. William Kirkpatrick, South F. C., Kirriemuir, and Rev. Gilbert Laurie, M.A., Fairbairn Memorial F. C., Glasgow, John George Durran, M.B., C.M., Kirriemuir, to Flora Margaret, elder daughter of Archibald Smith, Solicitor, Kirriemuir.

DYER—PRICE.—On Sept. 3rd, at St. Luke's, Uxbridge-road, W., Sidney Reginald Dyer, M.D., M.R.C.S., Barrister-at-law, of the Middle Temple, and Deputy Medical Officer of H.M. Prison, Wandsworth, to Rose, daughter of Henry Talbot Price.

JONES—GRUGGEN.—On Sept. 1st, at Amport, Andover, by the Rev. G. S. Gruggen, vicar of the parish, assisted by the Rev. Alfred Jones, late vicar of St. John's, Kenilworth, and by the Rev. E. G. Watts, brother-in-law of the bride, Edward Jones, M.R.C.S., of St. Columb, Cornwall, elder son of the Rev. Alfred Jones, to Josephine, third daughter of the Rev. G. S. Gruggen.

MONSARRAT—TURNEY.—On Sept. 6th, at Nottingham, Keith Waldegrave Monsarrat, F.R.C.S.E., of Liverpool, to Marguerite Ada, second daughter of Alderman Sir John Turney, J.P., of Nottingham.

NUTTALL—STEAD.—On August 25th, at the Parish Church, Leamington, by the Rev. Cecil Hook, vicar, assisted by the Rev. Murray Ragg, brother-in-law of the bride, Arthur Peel Nuttall, M.D. Lond., of Bury, Lancashire, to Dorothy May, fifth daughter of the late Maud Stead, of Harrogate, and of Mrs. Stead, of Leamington.

POOLE—HARLAND.—On August 22nd, at Holy Trinity Church, Ryde, I.W., by the vicar, Rev. W. M. Cameron, M.A., W. Evered Poole, Major, late 60th Royal Rifles, to Fanny Kate Elliott, younger daughter of Henry Harland, M.D., of Eastridge, Ryde, I.W., fomerly of Wadhurst and Tunbridge Wells.

SPICER—HUNTER.—On July 7th, at Marylebone Parish Church, by the Rev. F. Eliott, M.A., vicar of St. Luke's, Oseney-crescent, assisted by the Rev. Alfred Pugh, Assistant Chaplain to H.M. Prison, Holloway, Frederick Spicer, M.D., of Devonshire-street, Portland-place, elder son of Frederick Spicer, M.R.C.S., of Carleton-road, Tufnell-park, to Florence Annie, third daughter of the late Richard Hunter, of The Elms, Hilldrop-road, N.

WAINWRIGHT—CAVELL.—On August 25th, at St. Helen's Church, Ore, Sussex, William Longworth Wainwright, M.B., B.Sc., of Brixworth, Northamptonshire, to Mary Lilian, youngest daughter of the Rev. Frederick Cavell.

WALKER—PEDDER.—On Sept. 8th, at St. Michael and All Angels, Helensburgh, by the Rev. W. Perowne Holmes, Vicar of St. Peter's, Leicester, assisted by the Rev. J. Stuart Syme, Rector of St. Michael and All Angels, Walter W. Walker, M.B., B.C. Cantab., Peterborough, to Margaret, youngest daughter of William Pedder, Stirling.

WILSON—HANBURY.—On Sept. 2nd, at Chefoo, China, William Wilson, M.B., C.M., to Hilzabeth, second daughter of Cornelius Hanbury, of Richmond, Surrey.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this Office.

Lectures, original articles, and reports should be written on one side of the paper only, AND, WHEN ACCOMPANIED BY BLOCKS, IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers, not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. I. of 1898, which was completed with the issue of June 25th, and the Title-page to the Volume were given in THE LANCET of July 2nd.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1898, bound in cloth, gilt lettered, price 18*s.*, carriage extra; and Cases for binding the half-year's numbers, cloth, gilt lettered, price 2*s.*, by post 2*s.* 3*d.*, can be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

The rates of subscriptions, post free, either from THE LANCET Offices or from Agents, are:—

FOR THE UNITED KINGDOM.		TO THE COLONIES AND ABROAD.	
One Year	£1 12 6	One Year	£1 14 8
Six Months	0 16 3	Six Months	0 17 4
Three Months	0 8 2	Three Months	0 8 8

Subscriptions (which may commence at any time) are payable in advance.

THE COMMENDATORE DR. LAPPONI, BODY-PHYSICIAN TO THE POPE.

OUR Rome correspondent writes:—Giuseppe Lapponi studied medicine at the Bologna school, where he distinguished himself in the classes of Professor Concato and Professor Murri, the latter a pathologist and surgeon of high repute, and well known to the professional world as a contributor to THE LANCET. He graduated as Doctor in Medicine in 1875, and after for a brief interval assisting the Professor of Pathological Anatomy in Bologna, Dr. Tartuffi, he went into general practice, first at Capalone, in Tuscany, and next at Pollenza, near Macerata. There he remained till 1885, recommending himself by his skill,

his fertility in resource, and his self-reliance, while contributing with much acceptance to medical periodicals, Italian and French. In 1888 he had transferred his *penates* and practice to Osimo, when one day he received from the Vatican an invitation to become the Pope's body-physician, the holder of that post, who had also held it in the latter years of Pio Nono, being Dr. Alessandro Ceccarelli, an excellent practitioner who had won his fame as a surgeon and was by this time well stricken in years. Dr. Lapponi's reply was in the affirmative and he accordingly repaired to Rome, at first as assistant to Ceccarelli, who required him to pay a weekly visit to the Vatican, while still keeping a *piede-terre* at Osimo. This arrangement did not last long. Ceccarelli died and Dr. Lapponi succeeded him as "archiatro di Sua Santità" (physician-in-chief to His Holiness). In this position he speedily won the entire confidence of his august patient, who placed the whole management of his health unreservedly in his hands and came to consult him—as Pio Nono used to consult Ceccarelli—even on matters but remotely connected with the healing art. As years rolled by and His Holiness began more and more to feel their weight, Dr. Lapponi's attendance at the Vatican became gradually more assiduous, till of late his ordinary visits are never fewer than thrice weekly, sometimes every day, at others (when occasion requires) as often as three or four times in the 24 hours. As to the Pope's recent illness, or rather mild indisposition, of which the Continental press made so much, Dr. Lapponi gave no countenance to the alarmist reports set in circulation. His Holiness, according to Dr. Lapponi, was unwell for no more than two days—the cause, a slight access of intestinal catarrh due to the excessive heat. Hardly any treatment was resorted to—repose, absolute repose, was the line indicated; while, to put an end to the reports aforesaid Dr. Lapponi caused an editorial announcement to be made in the official organ of the Vatican—the *Osservatore Romano*—describing the clinical *status quo*. His Holiness himself used to smile gently at the sensational "intelligence" as to his condition, and always fell back on the directions of his physician, in whose hands his wiry, unbroken constitution had, he felt, all justice done to it. In March next he will be a nonogenarian, but Dr. Lapponi ventures to predict that—if no unforeseen complication occur—His Holiness will betray but small indication of the senile state. One reassuring feature in his case is the marvellous alertness of mind, above all the ready and unimpaired memory which never fails to recall names, events, and places with a precision, a promptness, and an accuracy which are the envy of his court. His faculties he maintains in admirable exercise, and on the Sunday succeeding his last illness (on August 21st) he recited to his physician twelve stately hexameter lines which he had composed in bed the night before, because he felt more wakeful than usual. Hygienic conditions, much more than active treatment, are what Dr. Lapponi relies on for the health of his patient, and among these are the avoidance of extremes of cold in winter and of heat in summer, the latter secured by four ventilators of the doctor's own devising by which the Holy Father's study and dormitory and audience-chambers are kept deliciously cool without draughts or sudden alternations of temperature. As to the Pope's daily life, it is already known to readers of THE LANCET. Early rising is secured by his being always in bed by 9 P.M., and the frugal meals he takes—*una piccolissima colazione* (a very slight breakfast) shortly after he gets up at 7 A.M. and a quite frugal dinner at 2 P.M.—amply suffice for the audiences, the correspondence, the composition of the allocutions, the encyclicals and the bulls which form so important a feature of the pontifical year. It is quite a mistake to suppose that he has in any way relaxed his solicitude as to official cares, ecclesiastical or other. He is closeted daily, and often for hours, with his Cardinal secretary, Monsignor Rampolla, whom he never keeps waiting, and, the moment the conference is over, he resumes his work, theological or ecclesiastical, as aforesaid, without perceptible loss of energy. Add to all this his delight in conversation when a congenial interlocutor presents himself, occasions on which he pours forth historical, literary, artistic and even scientific lore, amassed during long years of devotion to books—and some notion may be formed of the personality for whose bodily health and mental vigour Dr. Lapponi is not only answerable but effectively responsive.

WANTED A SCHOOL FOR THE DEAF AND DUMB.

A CORRESPONDENT asks for the address of a good boarding-school for a boy about ten years old who is deaf and dumb.

PULEX IRRITANS.

To the Editors of THE LANCET.

SIRS,—I notice in THE LANCET of May 14th, 1898, an editorial note in reply to a correspondent who had written to you to inquire "the best way of exterminating the flea-pest." For personal use the chloroform method suggested in your note is certainly the best. In particularly hot summers the resident staff of the London Hospital, when engaged in receiving-room and out-patient duty, were, in my time, always armed with a chloroform drop-bottle and at the least sign of irritation a few drops were poured on the clothing over the affected spot. But this method is not available for the general public and it is, moreover, defence at too late a stage. The best method of prevention lies in the annihilation of the breeding-places of the fleas. The larvæ are nourished on minute blood-clots deposited by the female flea in dirty clothing, carpets, cracks in the floor, and other convenient places.

According to one of the minor characters in Shakespeare fleas breed in putrid urine:

> *Second Carrier.* I think this be the most villanous house in all London road for fleas. I am stung like a tench.
>
> *First Carrier.* Like a tench! by the mass, there is ne'er a living christen could be better bit than I have been since the first cock.
>
> *Second Carrier.* Why, they will allow us ne'er a jordan, and then we leak in the chimney; and your chamber-lye breeds fleas like a loach. *King Henry IV.*, Part I., Act 2, Scene 1.

But this interesting observation in natural history lacks confirmation.

With proper cleanliness the eggs or larvæ should be destroyed at some time during the fourteen days occupied in the developmental process. In many badly constructed houses, however, with gaping cracks in the flooring, under the skirting board, &c., true cleanliness is hardly attainable. In such cases one of the various vegetable products which destroy or annoy the fleas may be freely used. In your note you mention common English lavender, but this is of doubtful efficiency. The powder of the dried flowers of various species of pyrethrum (the so-called "Persian" insect powder) stupefies and finally kills fleas and most other insects. In common use for many hundred years have been wormwood (Artemisia) and fleabane (Pulicaria). Of the former Tusser writes—

> "Where chamber is swept and wormwood is strown,
> No flea for his life dare abide to be known."

But the cheapest and most efficient of all the powders employed for this purpose is powdered fennel. My attention was first directed to its use by a note in Dr. Lauder Brunton's Materia Medica, second edition, page 852. "I am informed," he writes, "that the wild fennel growing in South Africa will completely drive away fleas from kennels and stables, and powdered fennel has a similar effect in this country." The powder must be used very freely and will then be found singularly effective. In a tenement house inhabited by some friends of mine in the Jews' quarter of East London, in which owing to the numerous floor-cracks which no broom could penetrate thorough cleanliness had failed to eradicate the pest, the floors and furniture were, on my advice, freely sprinkled with powdered fennel. In a fortnight the fleas had all disappeared, never to return.

I am, Sirs, yours faithfully,

Nagasaki. M. E. PAUL.

VISUAL PERCEPTION OF THE THIRD DIMENSION.

IN the July number of the *Psychological Review* Professor Charles H. Judd of New York University discusses various explanations of the visual perception of depth. After describing experiments with a thread extended forwards from the bridge of the nose and criticising the theory which makes sensations of movement the especial factor of all space-perception, he concludes as follows:—

> "Visual depth is thus conditioned by a certain relation of contradiction between the two-dimensional data of the retinal image or between the muscle-sensations which are connected with these images. The agreement between the elements in which the contradiction appears must be great, but it must not be complete, for the contradiction is an essential element. Depth, then, may be properly defined as a form rather than as a content of perception. It is not in any sense an original attribute of sensation. ..... It is, of course, like all psychical experience, subjective, but its source is just as much objective as is that of the sensation qualities which are arranged in space."

THE POST OF MEDICAL OFFICER OF HEALTH AT BINGLEY.

THE *Bradford Observer* recently contained an advertisement from the Bingley Urban District Council which ran as follows:—

> BINGLEY URBAN DISTRICT COUNCIL.
>
> The Council propose to appoint a MEDICAL OFFICER OF HEALTH for the district of Bingley, comprising an area of 11,800 acres and a population of 18,500. The appointment will be made subject to the regulations of the Local Government Board, under their General Order of the 23rd March, 1891.
>
> Applications, stating salary required, to be addressed to me not later than Saturday, Sept. 10th.
>
> R. ARMISTEAD, Clerk to the Council.
>
> Town Hall, Bingley, August 20th, 1898.

That candidates should themselves state the salary for which they would be willing to work is, in our opinion, a most unfortunate feature in the projected appointment. The words of the advertisement suggest that the Bingley Urban District Council are prepared to hand over the care of the public health of the community to the medical man making the lowest tender.

DANGERS OF CHRYSAROBIN.

IN the *Deutsche Medicinische Wochenschrift* of August 25th Dr. Max Linde, an ophthalmic surgeon in Lübeck, describes the case of a man who suffered severely as a result of treatment with chrysarobin ointment. He had for seven years been the subject of general psoriasis, but was otherwise healthy and was free from syphilis. Four years ago the disease almost entirely disappeared after painting with a solution, but this was followed by a relapse and for the last two years the eruption has covered the whole body with the exception

of some limited spaces. Since the beginning of last January the medical man in attendance had made use of iodide of postassium, sulphur ointment, pyrogallol dissolved in traumaticin, and Fowler's solution, but as no improvement was produced he adopted active treatment with chrysarobin. From Feb. 23rd to Feb. 28th he used a weak ointment of Goa powder and vaseline (1 to 3), and from Feb. 28th to March 21st a stronger ointment consisting of 1 part Goa powder to 4 parts vaseline. The patient was warned of the danger to his eyes, and he carefully followed the directions given him for their preservation; but eighteen days after the commencement of the treatment their condition was very bad. In the right eye the conjunctiva was extremely red, velvety, and somewhat swollen; the cornea was white (*milchig*) and opaque, and at the meeting of the lids the epithelium was absent over a space of ⅛ in. (3 mm.) long and ⅛ in. (5 mm.) broad; the sensibility of the cornea was greatly impaired but not entirely lost. The patient felt no actual pain, but only "something burning." In the left eye the corneal epithelium was macerated and wavy but not broken; its sensibility was impaired. Both pupils were of the size of pinheads and did not react. The iris was hyperæmic and the ciliary border was injected bluish-red. With the right eye a finger could be seen at a distance of 4 ft. and with the left eye at a distance of 8 ft. The urine contained abundance of albumin, red and white blood-corpuscles, and a few granular casts. The patient complained of weakness and palpitation of the heart. On using atropine and stopping the inunction he improved to some extent, but did not regain his original condition. When the last examination was made on May 22nd, eight weeks after the commencement of the treatment, his cornea showed opaque spots penetrating to the deep layers; the epithelium was smooth and gave a reflection everywhere; the pupils were of ordinary size, and reacted normally; there was no irritation. The urine still contained albumin, white blood corpuscles, and granular casts. The psoriasis had again appeared on different parts of the body, especially on the face and back; a cautious attempt to resume the treatment was in a few days followed by renewed irritation of the eyes. Dr. Linde recommends that whenever chrysarobin is used a careful watch should be kept for constitutional symptoms, such as contracted pupils, impaired sensibility of the cornea, pericorneal injection, and abnormalities of the urine, on the occurrence of which the treatment should be immediately stopped. The same precautions should be taken with pyrogallol, which is more poisonous than chrysarobin and more liable to attack the kidneys.

"THE TITLE OF 'DR.'"

To the Editors of THE LANCET.

SIRS,—I have read with interest the letter of "X." in THE LANCET of August 27th. In the town where I am in practice three of my fellow-practitioners who are M.R.C.S., L.R.C.P., boldly write "Dr." on their doorplate and visiting cards.—I am, Sirs, yours faithfully,

August 26th, 1898. G. D. E.

REAGENTS FOR FREE HYDROCHLORIC ACID IN THE GASTRIC JUICE.

A SERIES of experiments on the identification of free hydrochloric acid in presence of acetic, lactic, and butyric acids has been made by Dr. R. Ricci at the Istituto di Clinica Medica in Milan and the results are published in the *Gazzetta degli Ospedale* of Aug. 14th. Weigert's hæmatoxylin in aqueous solution gives a very fine yellow colour with all acids; this reaction is of such delicacy that it will show traces of free hydrochloric acid inappreciable by other means. Toiseau's reagent (the composition of which, however, is not stated) is also extremely sensitive. If 1 c.c. be mixed with a like quantity of filtered gastric juice in a test-tube the organic acids cause no change, but in presence of free hydrochloric acid the violet colour becomes light blue. Tungstate of soda in saturated solution has the property of giving a white precipitate with free hydrochloric acid, but is unaffected by the other acids; 1 c.c. of it is mixed in a test-tube with from 1 c.c. to 5 c.c. of filtered gastric juice; the precipitate forms in the upper part of the tube. The other reagents experimented with were safranine, vesuvine, methyl green, dahlia, and malachite green.

A REPUDIATION.

To the Editors of THE LANCET.

SIRS,—A most annoying mention of my name having been made in an article on Buxton and its Treatment in Wednesday's *Sun*, I at once addressed a letter of remonstrance to the editor of that paper, and this duly appeared. I find, however, that an unfair use is being made of the incident, and I venture to ask you to publish this disclaimer to the medical profession. I am, Sirs, yours faithfully,

Buxton, Sept. 5th, 1898. WM. ARMSTRONG.

FORMALIN IN INSECT STINGS.

To the Editors of THE LANCET.

SIRS,—As the subject of insect stings is mentioned in a recent annotation in THE LANCET, may I point out that "formalin" (recommended some time ago for mosquito bites in one of the medical journals by a Zanzibar correspondent) is an excellent remedy for the irritation produced by the stings of all insects? The "bite" is touched with the moistened stopper of the "formalin" bottle and as soon as the application begins to smart the excess of "formalin" is wiped off; relief is almost instantaneous. I am, Sirs, yours faithfully,

F. HYDE MABERLY.

Brooklyn, Earl's Court-square, S.W., August 30th, 1898.

Tse-Tse.—Although much work has been done on the Tse-Tse fly disease its records exist only in pamphlet form. In the recently issued work on "The Infective Diseases of Animals," a translation of vol. i. of Friedberger's and Fröhner's "Veterinary Pathology," there is an original chapter on the subject by the translator, Captain Hayes, F.R.C.V.S. The account given is, however, very short and does not add to what is already known. We know of no better pamphlet than that by Major Bruce, of the Royal Army Medical Corps, entitled "A Further Report on the Tse-Tse Fly Disease."

X. Y. Z.—1. A house surgeon is bound to obey the authorities of his hospital. He must therefore grant the certificates as he is directed by the committee. 2. He may charge no fees without leave of the governing body of his hospital. 3. The committee has a right to levy any fee it likes.

Fundus Oculi.—Our correspondent will find "Sight Testing for the General Practitioner," price 2*s.* 7*d.* post free (P. Davidson, 107, Great Portland-street, London, W.), useful for the purposes which he mentions.

Southern Cross.—Certifying surgeons under the Factory and Workshop Act are appointed by the inspectors of factories. Our correspondent should apply to Dr. Whitelegge, Home Office.

A. R. M. E., from his account of the matter, has been shabbily treated. A solicitor on seeing the letters which have passed could best say what remedy he has.

U.C.H.—The Warrant for giving substantive rank is published in our present issue but the title of Indian Medical Service is still retained.

M. D. will find our reasons in the leading article to which we have already made reference.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Sept. 8th, 1898.

Date.		Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radia in Vacuo.	Maximum Temp. Shade.	Min. Temp	Wet Bulb.	Dry Bulb.	Remarks at 8.30 A.M.
Sept.	2	30·33	W.	...	113	78	52	55	60	Fine
"	3	30·37	W.	...	117	84	59	60	64	Fine
"	4	30·35	S.E.	...	116	84	62	65	70	Fine
"	5	30·30	S.E.	...	106	79	62	63	64	Overcast
"	6	30·16	S.E.	...	107	80	63	63	64	Overcast
"	7	30·03	S.E.	...	105	86	63	63	64	Foggy
"	8	29·99	E.	...	122	89	64	65	69	Hazy

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (12th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M., Ophthalmic 1.15 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), St. Mark's (9.30 A.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), Westminster (2 P.M.), London Throat Hospital (2 P.M.).

TUESDAY (13th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat Hospital (2 P.M. and 6 P.M.).

WEDNESDAY (14th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat Hospital (2 P.M.).

THURSDAY (15th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex, (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat Hospital (2 P.M.).

FRIDAY (16th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M., Ophthalmic 10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat Hospital (2 P.M. and 6 P.M.).

SATURDAY (17th).—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), Cancer (2 P.M.), London Throat Hospital (2 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

Communications, Letters, &c., have been received from—

A.—Dr. Grant Arnott, Newcastle-on-Tyne; Messrs. Arnold and Son, Lond.; Mr. W. D. Akers, Bath; Dr. A. S. Ashmead, New York; Mr. A. Arnold, Tokio.

B.—Mr. S. H. Benson, Lond.; Mrs. Barlow, Battle; Surgeon Bolster, Chatham; Messrs. Burgoyne, Burbidges, and Co., Lond.; Birmingham General Hospital, House Governor of; Messrs. W. H. Bailey and Son, Lond.; Mr. J. Bines, Lond.

C.—Dr. J. A. Codd, Wolverhampton; Mr. R. H. Capper, Battle; Messrs. Cassell and Co., Lond.; Mrs. Chapman, Lond.; Cantab, Lond.; Cortland Wagon Co., Lond.; Dr. W. F. Cole, Wago, Texas; Dr. G. C. Crichton, Lond.; Messrs. T. Cook and Son, Lond.

D.—Mr. T. Dixon, Lond.; Dr. C. V. Dingle, Middlesbrough; D. A. C.; Doctor, Birmingham.

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